

## New Westinghouse Unit Conditioners Can Handle Jobs Up To 30 Tons

(Concluded from Page 1, Column 3)  
enclosed cabinets, designed to deliver the results expected from individually engineered air-conditioning jobs.

Power, water, and drain connections are the only things necessary to put the units in operation. Requiring a minimum of floor space, every unit can be carried through a 3-foot door opening. Largest unit occupies 2 feet 10 inches, and is 6 feet 6 inches deep and 5 feet 4 inches high. Through compactness and elimination of installation material, weight of the units also has been reduced.

Ratings of the complete line include 1, 2½, 3½, 6, 7½, 10, and 15-ton jobs. These units may be combined to provide multiples of the given ratings, providing a wide range of capacities available for commercial installations up to 30 tons.

Westinghouse hermetically sealed compressors are employed in the units. Two switches permit maximum flexibility of operation, one controlling the entire cooling mechanism and the other the blower motor, so that air circulation may be provided when cooling is not necessary. Cabinets are of all-steel welded construction, to insure rigidity.

Units of the new line, it is said, are adaptable to winter air conditioning through installation in the cabinets of heating coil, humidifier, and other necessary accessories.

Additions to the Westinghouse home heating and air-conditioning line are designed to give the company a complete range of winter units suitable for the addition of summer cooling equipment, hand-fired coal gravity warm-air furnaces in both steel and cast-iron construction, and an automatic gravity gas-fired warm-air furnace.

With the new models, Westinghouse now has for the mass replacement and new home market coal-fired gravity furnaces in cast-iron, heavy-duty and normal-duty steel construction, convertible for use with stokers or gun-type or rotary oil burners; and gas-fired gravity steel furnaces ranging in register capacity from 51,000 to 128,000 B.t.u.

For the larger new-home and higher-income replacement market, the company now has oil and gas-fired boiler-burner units for steam, vapor, and hot water, and coal, oil, and gas-fired winter air-conditioning units in a variety of sizes and capacities. Coal-fired units are adaptable to oil or stoker firing.

For the small-home and apartment market, the company has vertical-type gas-fired winter air-conditioning units offering individual comfort control to the apartment or home with or without a basement.

Equipment for the conversion market includes conversion oil burners, blower-filter units, and spray-type and drip-type humidifiers, together with temperature and humidity controls.

Summer air-conditioning equipment for the home includes a 3-ton cooling unit, which may be installed in the supply duct of any central duct system equipped with adequate blower and filter equipment; air-cooled and water-cooled room coolers, and ceiling-suspended type packaged cooling units of 1-ton capacity.

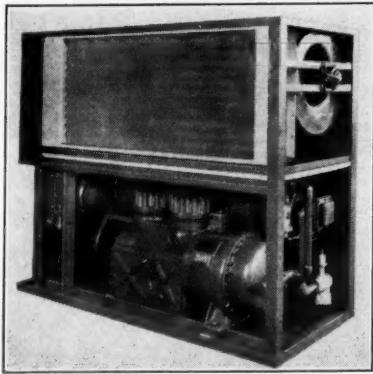
### Package Units Open Way For Small Dealer—Danley

EAST SPRINGFIELD, Mass.—Introduction of the "packaged" unit is the most significant contribution to the expansion of the air-conditioning market that the industry has had since its earlier stages of development, says P. Y. Danley, manager of the air-conditioning department of Westinghouse Electric & Mfg. Co.

"I believe the air-conditioning industry is on the threshold of an era of unprecedented promotion, popularity, and profit," Mr. Danley said. "Each year we in the air-conditioning industry have hopefully predicted that the following season would be 'the year,' and that this infant industry had grown from its swaddling clothes into a lusty, well developed youngster."

"It is true that we have been making steady and healthy progress, but I believe we've all been a little disappointed with the rate of growth, if we'd all be honest with ourselves."

### It Goes Through a Door



Interior view of the new 15-ton Westinghouse "Unitaire" reveals its compact design.

It's true that the retarding factors have, in many instances, been beyond control of the industry.

"Perhaps an analysis of our problems and the way we attempted to solve them would reveal that we, as an industry, weren't quite ready to put on long pants. We had consumer acceptance and interest, but we didn't have adequate distribution. Many of the objections presented by the customers were the result of an inadequate and unsettled method of distribution, and it's easy to trace these perplexing problems to their source now that we have paid for the experience."

"We can base our optimism on three factors:

"1. Continued consumer acceptance and popularity.

"2. Better and wider distribution.

"3. The introduction of a broad line of packaged units in capacities up to 15 tons, both for inside and remote installations with duct systems."

"To give a better picture of the vast market awaiting the industry, providing the product and distribution problems are solved, there are some:

"40,000 dry goods and small department or general stores

"125,000 restaurants

"64,000 beauty shops and barber shops

"58,000 or 59,000 drug stores.

"Add to this list the almost countless thousands of candy stores, small offices, apparel shops, banks, theaters, mortuaries, and a dozen additional prospects, and you will have some idea of the magnitude of the market."

"These prospects represent available present 'in business' organizations. They don't take into consideration the vast market presented by the new building and construction that is now hitting its stride."

"This mass market is now opened to us through the medium of 'packaged' air conditioning, observed only as a trend in 1938, but an important factor in 1939. It is important because it eliminates the engineering of the refrigeration cycle on unit installations from 1 to 15 tons."

"By packaged air conditioning, I mean a unit for the contractor which has all refrigeration connections, internal wiring, piping of refrigerant, and the like—factory-built and tested. Two identical packaged air-conditioning units may be installed in a square office or a long, lean dress store providing entirely different problems in installation and provision for getting rid of heat."

"Introduction of the broad spread of packaged units is going to increase the potential market because:

"1. It makes for wider and better distribution.

"a. It eliminates the need for refrigeration work on the job.

"b. It opens the air-conditioning business to the smaller heating and ventilating contractors who have stayed out of the business because of technical engineering difficulties."

"2. It makes for better lower-cost installations.

"a. Much of the technical planning and contract work is eliminated.

"b. It is lighter in weight and smaller in size than were the earlier systems."

"Not only are we at Westinghouse predicting the invasion of this mass market, but we have changed our distribution to take care of this anticipated increase in sales and promotion."

"Where a small contractor uncovers a complicated application, we expect to provide a direct tie-in with our regular engineering contractors to make available up-to-the-minute engineering practice. Technically, heating and ventilating engineering organizations have made tremendous strides the past few years and are an increasing factor in providing the proper answer for complicated jobs."

"Approximately 100 authorized engineering contractors in as many cities had produced a very satisfactory volume in 1937, but when the recession arrived their ability to produce was cut in half. We analyzed our territories, and we made some startling discoveries. The 100 engineering contractors had territories averaging almost half a state each. Yet they had been cultivating only their own home towns."

"On maps which we prepared, indicating installations with little red dots, the distribution picture showed a grouping of installations in and very near to headquarters cities, but practically nothing in the rest of the territories."

"Half a state is a very large territory. The only way to cultivate such broad business opportunities is to set up our present outlets to distribute to associate engineering contractors in the important smaller towns within their territory."

"With a 'packaged' line of units we feel through these distributors we have something worthwhile to offer this associate contractor. We have eliminated the mystery and complicated refrigeration work on the job. We have recognized our responsibility as a manufacturer to engineer the product at the factory and present it to our distribution channels as a ready-made job."

## Present Credit Terms Don't Need Changing, Say Finance Firms

(Concluded from Page 1, Column 4)

Competition from banks on the financing of instalment paper was discussed by several speakers at the meeting. Development of a sales financing division is a reasonable move for banks, it was pointed out, since more profit can be made from such financing than from the investment of excess capital in low-interest bearing bonds.

It was not thought, however, that competition of banks in the sales financing field would result in lower instalment rates.

The schedule of minimum down payments and maximum terms adopted by the National Association of Sales Finance Companies in September, 1937, indicated a trend toward standardization on general terms of 10% and 24 months to pay the balance.

Rate on household electric refrigerators called for a down payment of 10% or \$5, whichever was the greater, with 30 months as the maximum time payment limit. Same rates applied to ranges.

Packaged commercial refrigeration sales (water coolers, beverage coolers, room coolers, display cases, milk coolers) terms were set at 10% down and 24 months to pay. Non-packaged goods, where cost of installation often was an important cost factor, called for 20% down (or more, if necessary to cover the cost of installation) and maximum terms of 24 months.

## G-E Distributor Heads New Electric League In Hartford, Conn.

(Concluded from Page 1, Column 5)

tional meeting, Mr. Kilbourn declared that the group would confine its activities to maintenance of high ethical standards and trade practices in local electrical circles.

Although active membership will be restricted to persons directly engaged in the electrical industry, associate memberships will be available to architects, sales engineers, and others whose activities touch this field.

League members will be identified by an official seal and approved appliances will be tagged to insure the sale of highest quality merchandise.

A campaign to sell at least \$350,000 worth of equipment and also push appliances in 500 complete electric homes before Jan. 1 is occupying the immediate attention of the league. Prizes will be awarded to the salesmen who do the most to help achieve this goal.

Mr. Kilbourn pointed out that the league invites comments and criticism from the public as well as from anyone in the industry.

Besides Mr. Kilbourn and Mr. DeLaney, officers of the association are: S. K. Lavery, vice president; John H. Bauer, treasurer; and Frank Linbacher, secretary. The board of governors consists of Mr. Kilbourn, Mr. Lavery, Mr. Bauer, Frank Cashman, Francis Stern, Thomas O'Brien, R. E. Arnold, and Bret Neece.

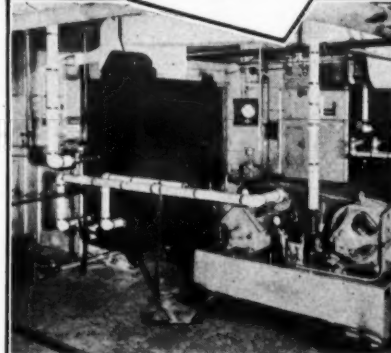
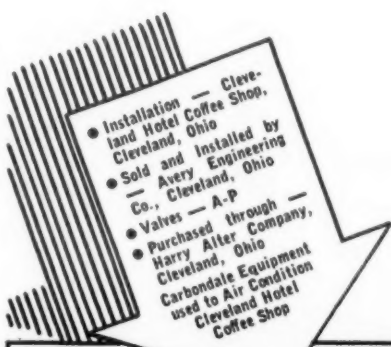
## "Coffee and . . ."

### In Year 'Round Comfort at Cleveland Hotel • Coffee Shop..



"Installed and forgotten" — That's the "label" given to A-P Valves by the men who use them and watch their unusual efficiency on every Air Conditioning and Refrigeration installation. This type of service-satisfaction builds goodwill, not only for owners, like the Cleveland Hotel, but more particularly for the Engineers responsible for these famous installations.

Add A-P Valve reputation to your own — it will mean more profit, less service expense!



REFRIGERATION PARTS JOBBERS, WHO RECOGNIZE QUALITY, STOCK A-P CONTROLS

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2450 NORTH THIRTY-SECOND STREET  
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Export Address:  
100 Varick St., New York City



DEPENDABLE

THE BYWORD FOR A-P VALVES



# Air Conditioning & Refrigeration News

The Newspaper of the Industry

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## THE COLD CANVASS

By B. T. Umer

### Keyhole Enough

Arguments over how high the bedroom window shall be raised these wintery nights can now be settled by referring the Fresh Air Fiends (of which Old B. T. U. is a charter member) to Dr. Irving S. Cutter, dean of the Northwestern University medical school.

Speaking before the Chicago symposium on air conditioning last week, Dr. Cutter maintained that a keyhole provides adequate fresh air inlet to a bedroom with a single occupant!

### Crosley's Car

Dealers who have asked us if the projected Crosley automobile will take its bow at the 1939 auto shows may now relax and devote their time to selling refrigerators and radios. No Crosley Car is contemplated just now.

True, Powell Crosley, Jr., has been experimenting with a light, European-type automobile for some time. (Concluded on Page 9, Column 1)

## IN THIS ISSUE

Down in Shreveport, La., a dealer has found a new angle on prospect files that works. Instead of setting a time limit on prospects, each salesman is limited to 100—which provides for automatic and regular revision. Further details on page 2.

Dramatizing the personalities of individual salesmen, rather than glorifying the company, gets results for a famous dealership in Little Rock, Ark. How these salesmen reward "tips" is related on page 2.

To those fascinated by opportunities in the locker storage field, description of a brand new method on page 4 will be interesting indeed.

National Retail Dry Goods Association surveys 370 new department store workers, and reports their reactions to their jobs and their superiors on page 14. There are some ideas for every employer.

What's wrong with the ironing machine business? The Electric Appliance Society of California has four answers, which have been embodied in a corrective plan. See page 2 for details.

Frank Stiefel of Salina, Kan., is selling appliances for Christmas gifts by offering to wrap them in special Christmas packages, and to deliver them on Christmas morning. Story told on page 2.

Revised thinking on many phases of air conditioning for human comfort is outlined by leading industry authorities on pages 6, 7, and 16.

How General Electric's product service division capitalized on past flood experience to cash in on New England's rehabilitation work is told on page 10. Other valuable service information on pages 11, 12, and 13.

## 'Informal' Sessions Feature as ASRE Meets Dec. 6

NEW YORK CITY—Informal conferences and discussion on quick freezing, air conditioning, and market research combine with technical sessions of a practical slant in the program for the thirty-fourth annual meeting of American Society of Refrigerating Engineers, to be held Dec. 6 to 8 at the Hotel Commodore.

A colored movie, showing the orange juice freezing activities of California Consumers Corp., will be presented by Nels Rosberg, west coast refrigerating engineer, at the conference on quick freezing scheduled for the afternoon of Dec. 6. Contributors to the discussion will include Harden Taylor of Atlantic Coast Fisheries, R. Brooks Taylor of the University of Tennessee, and Ralph Jenkins of the New York State Experiment Station.

Quick freezing and foods people from various parts of the country (Concluded on Page 3, Column 1)

## Mills & Baker Sign I. T. & T. Contracts

NEW YORK CITY—Through two additional contracts signed with Mills Novelty Co. and Baker Ice Machine Co., the International Standard Electric Corp., world-wide manufacturing and sales subsidiary of International Telephone & Telegraph Corp., is now equipped to supply abroad a complete line of electric refrigeration and air-conditioning products, it was announced last week.

A contract with Gibson Electric Refrigerator Corp. on household (Concluded on Page 16, Column 4)

## Brass & Copper Sales Co. Buys Spangler Assets

ST. LOUIS—United States District Court No. 2 of St. Louis on Nov. 22 approved the sale by the trustee, Robert T. Hensley, of most of the assets of the Spangler Co. to Brass & Copper Sales Co., 2817 Laclede Ave., reports H. H. Hubbell, general manager of Brass & Copper Sales Co.

Assets of Spangler Co. purchased by Brass & Copper Sales Co. included the complete inventory of stock, all the accounts receivable due the Spangler Co. as of the close of business on Nov. 9, and furniture, fixtures, and equipment, Mr. Hubbell reports.

Transfer of assets started the afternoon of Nov. 22, and it is expected that by Dec. 1 all the inventory will be transferred to Brass & Copper Sales Co. (Concluded on Page 3, Column 1)

## Convention Calendar For the Industry

American Society of Refrigerating Engineers, Dec. 6-8, 1938, Hotel Commodore, New York City.

First All-Industry Refrigeration and Air Conditioning Exhibition, Jan. 16-19, 1939, Hotel Stevens, Chicago.

Refrigeration Supplies and Parts Manufacturers' Association, Jan. 16-19, 1939, Hotel Stevens, Chicago.

National Refrigeration Supply Jobbers' Association, Jan. 16-19, 1939, Hotel Stevens, Chicago.

Organization meeting of the proposed Air Conditioning Dealers and Contractors Association, Jan. 16-19, 1939, Hotel Stevens, Chicago.

American Society of Heating & Ventilating Engineers, Jan. 23-26, 1939, Hotel William Penn, Pittsburgh.

Winter Furniture and International Home Furnishings Markets, Jan. 9-21, 1939, Merchandise Mart and American Furniture Mart, Chicago.

Palmer House Show of Housewares (House Furnishings Manufacturers Association of America), Jan. 8-14, 1939, Palmer House, Chicago.

National House Furnishings Manufacturers Association, Jan. 8-14, 1939, Hotel Stevens, Chicago.

### Distributor Conventions

Kelvinator—Dec. 1-2, 1938, Hotel Book-Cadillac, Detroit.

Westinghouse—Dec. 8-9, 1938, Mansfield, Ohio.

Stewart-Warner—Jan. 5-7, 1939, Edgewater Beach Hotel, Chicago.

## 'Make People Comfortable' Is Keynote For Air Conditioning Sounded At Chicago

CHICAGO — Lining the walls, crowding the aisles, and sitting on the floor, more than 900 contractors, engineers, and architects from the Chicago area (and some who had journeyed from St. Louis, Indianapolis, Cleveland, and Detroit) jam-packed the Engineering Building auditorium Tuesday, Nov. 22, to hear a distinguished panel of seven recognized authorities conduct a symposium on "Air Conditioning for Human Comfort."

Speakers were Dr. Irving S. Cutter, dean of the Northwestern University medical school; Charles S. Leopold, consulting engineer; John R. Hertzler, York Ice Machinery Corp.; Albert Buenger, Delco-Frigidaire Conditioning division, General Motors Corp.; Elliott Harrington, General Electric Co.; William B. Henderson, executive vice president, Air Conditioning Manufacturers Association; and Willis H. Carrier, president, Carrier Corp.

Sponsors of the meeting were the Chicago chapter of the American Institute of Architects, the Illinois Society of Architects, the Illinois chapter of the American Society of

## Air Conditioning Dealers Insist New Association Is Needed

### Overflow of Exhibitors Seen By All-Industry Show Committee

CHICAGO—Present indications are that the entire floor space of the Exhibition Hall of the Stevens hotel will be required to meet the demand of exhibitors in the All-Industry Refrigeration and Air Conditioning Exhibition to be held Jan. 16-19, 1939, reports M. W. Knight, sales manager of Peerless of America, Inc., and chairman of the exhibition committee.

Mr. Knight has called a special meeting of the exhibition committee, to be held here Dec. 2.

The 79 exhibitors signed up at (Concluded on Page 9, Column 2)

## Price Law on '39 Units Held Likely In N. Y.

BROOKLYN—Prospects for the registration of 1939 model electric refrigerators under New York's Feld-Crawford Fair Trade Act are encouraging, Russell A. Atkinson, chairman of the refrigerator com- (Concluded on Page 3, Column 2)

### Opposed By Delegates From Association of Heating Contractors

DETROIT—The smouldering conflict between air-conditioning dealers and the heating and piping trades broke out in the open here this week when representatives of the Heating, Piping, and Air Conditioning Contractors' National Association and the Chicago Master Steamfitters' Association appeared at the meeting of air-conditioning dealers held in Detroit on Monday, and vigorously opposed the organization of the proposed Air Conditioning Dealers & Contractors Association.

Purpose of the Detroit meeting was to make plans for the organization meeting of the proposed new association scheduled for Jan. 17 at the Stevens hotel, Chicago, during the All-Industry Refrigeration and Air Conditioning Exhibition.

Citing the Chicago pattern of industry organization, where an air-conditioning contractor must be a member of the Master Steamfitters' Association to be assured an adequate supply of labor to install air-conditioning systems, George H. Dickerson, Mehrling & Hanson Co., Chicago, president of the Heating, Piping, and Air Conditioning Contractors National Association, asserted that "air-cooling equipment should be sold as a part of a larger contract, and the country should follow our Chicago system where there is no such thing as a 'closed franchise' on air-conditioning equipment."

"Members of our Chicago organization are free to purchase equipment from any major manufacturer and install it for our customers. Our customers can have any refrigeration equipment they desire."

"When we install a heating system we do not care what kind of a boiler is used, and when we install a cooling system we do not care what kind of a refrigerating machine is used, so long as it operates in a satisfactory manner."

"Air-cooling equipment should be (Concluded on Page 10, Column 1)

## Larkin Makes Chicago His Headquarters

BALTIMORE—Lester U. Larkin has resigned as president and a member of the board of directors of Lester U. Larkin, Inc. here to engage in the production and marketing of refrigeration coils and other products in the Chicago territory as a licensee of "LUL" assembly machines and the "LUL" Process.

Mr. Larkin, originator of the cross-fin coil and inventor of the (Concluded on Page 16, Column 5)

## They Spoke of New Trends In Air Conditioning Before 900 Listeners At Chicago Symposium



(1) Albert Buenger of Delco-Frigidaire tells the Chicago air-conditioning symposium that "the handling and distribution of air within the conditioned space is probably the least understood phase of air conditioning."

(2) Elliott Harrington of General Electric points out the importance of humidity control in large public assembly rooms. (3) "Excessive heat is a great disturber of the nervous system and hence of sleep," declared

Dr. Irving S. Cutter, dean of the Northwestern university medical school, "and high humidities prevent what is known as invisible perspiration." (4) John R. Hertzler of York succinctly outlines the several forms

of energy which have been utilized in operating air-conditioning systems. (5) Charles S. Leopold, Philadelphia consulting engineer, asserted that the Metropolitan Life studies were "gratifying," inasmuch as they indicate that

summer comfort can be produced without harmful health concomitants. (6) Increased emphasis should be placed on humidity control in air conditioning for human comfort, said Willis H. Carrier of Carrier Corp.



## Profitable Sales Ideas

### Little Rock, Ark. Distributor Makes 'Independent Operators' of Salesmen

LITTLE ROCK, Ark.—Seven top-notch salesmen who operate so independently that they are "practically in business for themselves," and an extensive system of cash tips for employees, customers, or potential customers who turn in the name of a prospect to whom an appliance is eventually sold are the principal reasons why the electrical appliance department of 555, Inc. has been able to average 500 refrigerator sales a year, according to Jerry Dollins, sales manager.

"We realize," Mr. Dollins explained, "that to the average consumer our organization is just another large corporation, so we try to make our salesmen, who form our only real contact with the buying public, stand out as much as possible as individual personalities."

#### NAME ON DIRECT MAIL

"Most of the company's direct-mail advertising is sent out in the name of individual salesmen rather than in the name of the corporation, much of this type of promotion taking the form of postcards written in long-hand by the salesman himself. In addition, we quite often use newspaper advertisements and radio programs to play up the various personalities on our sales force."

"Because of our 'personality' policy, it is impossible to restrict the territory of any salesman, for each one has friends and acquaintances all over the city. We do, however, keep a carefully checked card index for the salesmen's protection, no man being permitted to solicit the customer of another."

#### CARD INDEX PROTECTION

"Salesmen work this card index thoroughly, always checking back on old customers in an attempt to sell them new appliances before their old time-payment contracts have expired. Customers who have had their appliances for a few years are encouraged to trade-in their old units on newer models."

"It pleases and sometimes mystifies our customers when one of our salesmen tells them just how long they have been using a certain appliance which they bought from us," Mr. Dollins pointed out, "and we sell a lot of appliances on this basis."

#### TIPS MAKE 'LIVE' USERS

"The tip system, however, is the one thing chiefly responsible for the hundreds of live prospects we contact each year," Mr. Dollins declared. "Salesmen urge their customers and their prospects to give them names of people to whom appliances might be sold. Frequently the men work through their old customers and prospects by asking them to put in a good word with any of their friends who might be in the market for some appliance."

"This tip system is practically endless, for if a salesman is not able to sell a refrigerator or some other appliance to Prospect A, he often can sell something to Prospect B, whose name has been suggested by Prospect A. In this case, Prospect A receives the tip, which averages about 2 or 3% on large sales and more if the sale is smaller."

#### IT PAYS TO GIVE

"Any person who receives a tip from us," pointed out Mr. Dollins, "is a better prospect than ever for future business. That \$3 or \$5 check which the person receives for the tip creates a more friendly attitude toward our organization, and often means more business for us. Then, too, the person who receives one tip is always anxious to furnish us with another lead that will result in another tip."

"We try to make our men have the feeling that they are practically in business for themselves, and our tip system does much to inspire this feeling. The salesmen build up tip prospects themselves, and they do the paying off. And not a month passes that we do not pay many tips to customers and to some of the 140 employees of 555, Inc."

### Vacuum Cleaner Makers Report on Sales

HOT SPRINGS, Va.—Celebrating its silver jubilee here, the Vacuum Cleaner Manufacturers' Association reported sales of 940,409 floor and hand models during the first nine months of this year, compared with 1,338,436 in the same period of 1937.

Floor models totaled 698,889, a decrease of 26.1% from last year, while drop in hand model sales was 36.9%.

September sales amounted to 102,014 units, compared to 90,557 in August and 139,024 in September, 1937.

Four founding members, active in the industry and the organization, were honored at the anniversary celebration. They were Fred Wardell, Eureka Vacuum Cleaner Co., Detroit, first president of the association, who was toastmaster at the silver jubilee banquet; Fred Bissell, National Super Service Co., Toledo, first secretary-treasurer and the organization's only honorary life member; H. W. Hoover, the Hoover Co., North Canton, Ohio, and Adam A. Breuer, Breuer Electrical Mfg. Co., Chicago.

Officers and executive board of the association were reelected. These include: president, R. J. Simmons, Birtman Electric Co., Chicago; vice president, P. A. Geier, P. A. Geier Co., Cleveland; secretary-treasurer, C. G. Frantz, Apex Electrical Mfg. Co., Cleveland.

### Number, Instead of Time Limit on Prospect List Eliminates Friction

SHREVEPORT, La.—To eliminate friction between salesmen over prospects, and to abolish specific time limits on prospect cards, limit each salesman to a maximum of 100 prospect cards in his file. This is the plan followed successfully by C. B. Raborn, manager of the appliance department of Booth Furniture & Carpet Co. here.

Length of time that a salesman can "file" on a prospect and thus protect himself in case the prospect should be sold by another salesman in the organization presents a problem to many appliance dealers. By setting a number rather than a time limit, Mr. Raborn claims to have solved the problem, and increased sales in the bargain.

#### SALESMEN SELECT BEST

Plan in operation is very simple. It is an automatic adjuster of prospect lists, it is claimed, and every salesman takes care of his own prospect list without any help from the office. Maximum of 100 prospect cards in the salesman's file not only eliminates fixing a time limit for the cards to remain in the file, but also makes the salesman very careful to include only the 100 prospects most likely to buy an appliance.

Another feature of the system is that it is "self-policing," because a salesman wishing to file a new prospect must remove one card to make a place for the new name. The card he removes will always be the one that he considers least likely to produce a sale, regardless of the time the name has been in his files.

Cards remaining in the file will be the most active on the salesman's list. Doubtful prospects are removed, even though some of these may be comparatively new. Selection of the cards is left entirely up to the salesman, who is careful to keep the 100 prospect cards which he thinks will produce the best and fastest sales.

#### IMPROVEMENT NOTED

Since Booth Furniture & Carpet Co. has established the plan, there has been very little friction between salesmen as to prospects. Files need not be checked to eliminate cards that have remained longer than the limit, because of the automatic and efficient elimination by the salesmen themselves, Mr. Raborn reports.

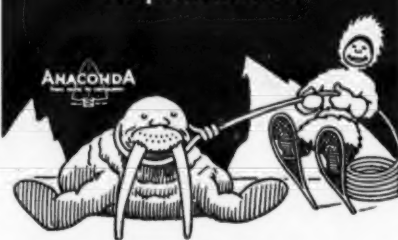
As all prospects are voluntarily dropped by the salesman, there can be no argument if another salesman sells the dropped prospect. It is certain that, before being cut out of the file, all prospects will first be examined closely as to their possibilities for appliance sales.

### 'Not Going Out of Business' Sale Is Successful

MANCHESTER, N. H.—An auction sale featuring the rather unusual tag, "We Are NOT Going Out of Business," was used successfully by Modern Homes Appliance Co. to dispose of a large surplus stock of refrigerators, washers, ironers, gas ranges, and heaters.

Several makes of appliances, including Hotpoint, Leonard, Maytag, and ABC, were put on the auction block in the unusual sale, which moved merchandise valued at thousands of dollars, the owners report.

### Anaconda Copper Refrigeration Tubes Dependable!



THE AMERICAN BRASS CO.

FRENCH SMALL TUBE BRANCH  
General Offices: Waterbury, Conn.

### California Appliance Society Trying 'Experimental' Ironer Sales Plan

SAN JOSE Calif.—Answer to the perplexing problem of "What's wrong with the ironing machine business?" may be forthcoming from the experimental merchandising campaign now being carried on in San Jose under sponsorship of the Electric Appliance Society of Northern California.

Outgrowth of an idea presented before a group of manufacturers and distributors by Bert W. Reynolds, promotional director of the society and domestic sales manager of Pacific Gas & Electric Co., the San Jose Plan constitutes an attempt to hurdle the four big barriers to increased ironer sales, as seen from the angle of the customer, the salesman, the dealer, and the distributor.

#### SHOW 'EM IT'S EASY

Fundamental problem from the standpoint of the customer, the society reasons, is the imagined difficulty of operation of the electric ironer. The San Jose Plan is combatting this detrimental consumer attitude by means of an extensive program of in-the-home ironing lessons designed to show the housewife how simply and effectively the ironer can lighten her laundering burden.

To carry out this educational campaign the plan committee has provided for a group of special tutors well versed in ironer technique. Salesmen will thus be relieved of their No. 1 worry in connection with ironer sales—the onerous task of teaching the customer how to use her new helper—and will be free to push ironer sales unhindered by the necessity of after-the-sale instruction.

#### INSTRUCTION PROVIDED

This policy of furnishing ironer instructors also makes it possible for the dealer to provide a course of instruction without having to pay for it out of his existing margin. Heretofore, the plan committee found, many dealers have been reluctant to push electric ironers because they felt that the educational work which necessarily must accompany the sale of each unit made the product too expensive to sell with the existing margin of profit.

The fourth problem—the fact that distributors generally have been concentrating on the comparatively easy-to-sell washers and have been letting ironer sales fall were they may—is solved in the San Jose Plan by placing responsibility for the successful operation of the entire scheme squarely on the distributors' shoulders.

#### DISTRIBUTORS RESPONSIBLE

Under this arrangement, the distributors not only make possible the removal of the first three obstacles, but are responsible for the policing of the entire plan.

Purpose of the whole program, the plan committee pointed out, is to create a larger ironer market (not just to stimulate competition among dealers over the few prospects who have already decided to buy) and to sell ironers on the basis of the value they will give on flat pieces and simple garments. This means that shirt ironing demonstrations are barred, and that features and gadgets are to be minimized, while the time-saving, labor-saving, money-saving, and results factors are to be played to the limit.

#### CAMPAIGN RAISES PRICES

During the test plan period, which continues until Dec. 31, a \$10 raise in the retail price of each ironer has been put into effect in San Jose and in the neighboring city of Santa Clara. Primary purpose of this increase is to finance the program of purchaser instruction.



MERCHANT & EVANS CO.  
Phila., Pa., U.S.A. Plant at Lancaster, Pa.

Since this educational work takes but \$6 of this \$10 increase, expenditure of the remaining \$4 is being left flexible, subject to the discretion of a plan committee composed of distributors appointed by the Electric Appliance Society and dealers appointed by the society's San Jose unit.

#### BONUS FOR SALESMEN

At present, the \$4 balance is being split so that \$2 may be used to give one in-the-home lesson on any ironer purchased prior to the test plan period, and the remaining \$2 used as a salesman's bonus.

The merchandising experiment is being backed by the Electric Appliance Society through a series of advertisements in local newspapers on the condition that these papers secure a specified amount of tie-in dealer advertisements. Radio broadcasting, dealer display cards, and other advertising aids are being used to round out the program.

#### UTILITY COOPERATES

Pacific Gas & Electric Co. is cooperating to the fullest extent in aiding and training the instructors provided by the distributors for the home demonstrations, and in providing other assistance.

Members of the plan committee, composed of retailers, distributors, and utility representatives, are:

C. R. Van Sant, chairman, Hart's (dealer); F. M. Downing, Farmers' Union ((dealer); C. H. Williams, Hale Bros. (dealer); Frank Accardi, Nathan-Dohrmann Co. (dealer); A. C. Scott, Apex-Rotarex Co. (distributor); George Dickey, Thor-Pacific Co. (distributor); C. T. Baumann, Westinghouse Electric Supply Co. (distributor); Ross Van Gundy and Mr. Reynolds, Pacific Gas & Electric Co.

### Gift-Wrapping & Christmas Morning Delivery Sell Major Appliances

SALINA, Kan.—Gift wrapping, even for the elephantine proportions of a 7-foot refrigerator is considered a good investment by Frank Stiefel, merchandise manager of the Stiefel Stores' Co. here, who claims that major appliances wrapped as Christmas gifts have outsold greatly the same appliances standing beside them on the display floor.

Dressed up in clear cellophane off-set with large red cellophane bows, one model of each the lines stocked by the electrical department is placed in the window or on the display floor, where slogans and cards call attention to the fact that a major appliance is a gift for the home and entire family.

The fancy wrapping, with a Christmas-morning delivery offer, is often the final touch which closes the holiday sale, Mr. Stiefel states.

### Cooperative Office Becomes Showroom For Appliances

PIQUA, Ohio—A. E. Halterman, superintendent of the Pioneer Rural Electric Cooperative here has turned a portion of his office into a showroom for electrical appliances. Although Mr. Halterman sells no appliances, the display gives members of the cooperative a chance to see the various units in actual operation.

A small motor exhibit, Mr. Halterman reports, has attracted the most attention. Supplementing his indoor display, the superintendent has installed in the yard of his quarters an electric brooder, complete with 100 chicks.

Members of the Pioneer cooperative have shown much interest in electric refrigeration, Mr. Halterman states, and plans are being discussed for the purchase of a carload of refrigerators.

ADD TO YOUR PRODUCT THE REPUTATION OF  
**PENN Controls**  
Write for Catalog  
PENN ELECTRIC SWITCH CO.  
GOSHEN, INDIANA

**DRY**

dry as Sahara

ANSUL CHEMICAL CO.  
MARINETTE  
WISCONSIN

THERE IS AN ANSUL JOBBER NEAR YOU

**ANSUL**

SULPHUR  
DIOXIDE

METHYL  
CHLORIDE

AC-2-8



## Variety of Subjects Await Engineers At Conclave Dec. 6-8

(Concluded from Page 1, Column 2)

will be on hand to learn the latest technique from these authorities, it is expected.

Air conditioning and market research conferences, to be held the same afternoon, will be arranged along the same practical lines, emphasis in the latter meeting being given to the problem of what statistics and data the refrigeration industry needs most, and how data of this nature should be collected.

Subjects ranging from refrigeration practice in the oil industry through new trends in compressor design and hospital air conditioning to refrigeration practice in the wine industry and food freezing temperatures will feature the convention's three technical sessions.

General topics of the sessions are air conditioning, industrial refrigeration, and foods and commercial refrigeration.

Speakers include David R. Morris of the New York Meteorological Observatory; Stewart F. Coey of the Research Corp., New York City; Dr. Albert G. Young of Corey Hill hospital, Brookline, Mass.; Prof. R. M. Smock of Cornell University; H. C. Guild of Vilter Co.; John R. Monsell of the Naval Aircraft Factory, Philadelphia; R. H. Heilman of Mellon Institute; Prof. A. W. Ewell of Worcester Polytechnic Institute; G. L. Marsh of the University of California; Max Levine, bacteria expert of Iowa State College; Dr. H. C. Diehl of the U. S. Department of Agriculture, Seattle; A. V. Ritchie, N. H. Hiller, Jr., and A. F. Brewer of the Texas Co.

Watson Davis, director of Science Service, Washington, D. C., will be the speaker at the welcome luncheon, scheduled for the opening day of the meeting, Dec. 6.

Social program for the convention includes an informal party on the first night, at the opening night of the Winter Sports Show at Madison Square Garden, followed by refreshments at Jack Dempsey's. Annual dinner-dance will be held at the Commodore on Dec. 7, and inspection trips to the New York World's Fair will be conducted on Dec. 8.

Women guests will be entertained at a luncheon and bridge party on Dec. 6, luncheon and matinee parties the following day, and will join in the World's Fair preview on Dec. 8.

Present officers of the A.S.R.E. are: Crosby Field, president of Flakice Corp., president; Gardner Poole, vice president of General Foods Corp., vice president; C. T. Baker, Atlanta consulting engineer, vice president; George Hulse, chief engineer of Safety Car Heating & Lighting Co., New Haven, Conn., treasurer; and David L. Fiske, executive secretary.

## Brass & Copper Sales Co., Parts Jobber, Buys Spangler Assets

(Concluded from Page 1, Column 2)

First refrigeration supply house established in St. Louis, Brass & Copper Sales covers the Illinois territory south of Galesburg, Peoria, and Bloomington, the extreme western part of Kentucky, and all of Missouri except those counties immediately adjacent to Kansas City.

M. Brown covers the central Illinois territory, W. J. Wind covers southern Illinois and southeastern Missouri, E. J. O'Brien, central and southwestern Missouri, and Norman Love, northern Missouri. Display trailer is operated in the entire territory as a means of displaying and demonstrating products.

Counter sales of the company are in charge of Charles Wunderlich, assisted by Glenn O'Toole. Otto Friemel assists all the salesmen with their engineering problems. Several former Spangler employees also have been added to the company's staff.

Trustee for the Spangler Co. has sent out a letter to all accounts concerned, notifying them that any balances due that company are to be paid to Brass & Copper Sales Co. Leland W. Kuhn, assistant treasurer of the company, is credit manager.

## N. Y. Dealers Urged To 'Remind' Manufacturers To List '39 Refrigerators Under Price Laws

(Concluded from Page 1, Column 4)

mittee of the Electrical Appliance Dealers Association of Brooklyn, told members of the group at their meeting last week.

Mr. Atkinson reminded dealers, however, that price registration under the act was not an accomplished fact, and urged them to continue to "remind" manufacturers, through their representatives, of their wishes.

Percy Peters, chairman of the association's radio committee, reported that violation of established

list prices on radios had dropped greatly in recent weeks, judging from reports of the four shoppers working in the field. He warned, however, that prompt action would be taken to halt any upsetting tactics.

Nominated for next year's offices, to be voted on at the next meeting, set for Dec. 28, were: president, George W. Magno; first vice president, Percy Peters; second vice president, Sol Scholder; treasurer, A. H. Grafenstadt; sergeant-at-arms, Sam Klein.

## Nebraska Supreme Court Dismisses \$2,800 Suit

LINCOLN, Neb.—The Nebraska Supreme Court has sustained the dismissal by the district court of Lancaster county of a \$2,800 breach of contract action brought by Hymen Zelen, Lincoln refrigerator distributor, in which Zelen sought to recover damages for alleged breach of an exclusive sales agency contract by Domestic Industries, Inc. on Buckeye refrigerators, no longer being manufactured.

Action on which the suit was based took place in 1932.

## Gray Pay Phone Co. Buys Anemostat Corp. Rights

HARTFORD, Conn.—Exclusive manufacturing rights to the air-conditioning devices made by Anemostat Corp. of America, together with a substantial stock interest in the company and representation on its board of directors, has been secured by Gray Telephone Pay Station Co.

Contract covering these provisions recently was signed by the two companies, it is said, following a vote by Gray Telephone stockholders amending its charter to permit it to engage in other business.

**DEALER**—  
"It's a sweet selling case. Real sales features and priced RIGHT!"

**WORKER**—  
"I KNOW this case is RUGGED! Steel and wood construction does it!"

**BUTCHER**—  
"Foods keep better, sell faster. This case will soon pay for itself!"

**CLERK**—  
"Its built-in features are great... automatic storage compartments, lights, wrapping boards, and scale station."

**ENGINEER**—  
"A display case lasts too long for anything but 100% PORCELAIN to be really satisfactory."

**CUSTOMER**—  
"The foods in this case certainly look fresh and appetizing."

# NOW - A Brand New Line of "Better Built" MIDWEST DISPLAY CASES

with New Beauty - New Features - New Salability!

Midwest leads again—this time with ONE LINE of display cases offering every feature of "deluxe" models—including 100% PORCELAIN finish—yet selling at prices which make them the biggest values in the refrigeration industry. There are no "extras" needed on Midwest Cases—no multiple lines to carry.

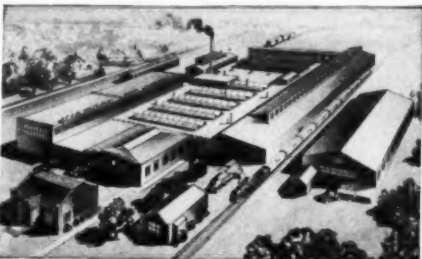
The complete resources, experience and equipment of one of America's finest refrigerator plants has been applied to give buyers everything they need in ONE LINE—modern production has made that line an economical one. Nothing has been overlooked, nothing has been "skimped"—here's real quality hooked up to economy.

You'll want to know all about this Midwest Display Case line. It's complete and packed with features buyers want. It has been merchant tried and proven. In the laboratory and in the field these Midwest Cases win! Factory-sponsored national finance plan, national advertising and factory support help you sell!

### "Midwest" Means a "Better-built" product...

Here—under one roof—Midwest Display Cases and other quality refrigerating products are built. Occupying over 7 acres of modern factories, Midwest has one of America's finest refrigerator plants, manned by several hundred skilled, loyal employees.

Export Sales Office: 330 S. Wells St., Chicago, Illinois  
Cable Address: MIDWEST-CHICAGO



MIDWEST MFG. COMPANY  
GALESBURG, ILLINOIS  
Without obligation, send me complete facts about the new Midwest Display Cases.

NAME \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
CITY \_\_\_\_\_ STATE \_\_\_\_\_

# MIDWEST MFG. COMPANY

GALESBURG ILLINOIS



# Locker Storages

## 'Polar Chest System' Is One Solution To Space Problem & 'Chills' of Customers

(See Picture on Page 15)

WASHINGTON COURT HOUSE, Ohio—The problem of limited space, heretofore a principal barrier to the installation of locker storage plants in retail markets, has been solved in a new type of locker system recently put into operation at Weaver's Clover Farms Store here.

First installation of its kind made to date, the new type system not only has solved the problem of limited space, but also has made possible an arrangement permitting customers to have access to their lockers in a room of normal temperature.

Called the "Polar Chest System," the plant's 400 storage lockers, in 100 units of four lockers each, are kept below floor level, and are raised to any desired height by means of an automatic lifting device. The lockers are concealed under insulated trap doors, called chest covers.

### FIRST PLANT

Marvin E. Weaver, owner of the Clover Farms Store, had been watching the development of the locker storage idea, hoping to find some means of adapting it to the limited space he had available. He met Roy W. Smith, refrigeration and locker storage man of Newark, Ohio, who had invented the "Polar Chest" system and was looking for a location in which to erect a trial plant.

The installation was made, and has been in successful operation for more than three months.

### 110 TRAP DOORS

Plant is located in a room 28 feet 4 inches long and 23 feet 3 inches wide, which formerly served as the storeroom of the Weaver store. Floor of the room is divided into 110 trap doors, called chest covers. Opened, the covers reveal a tier of metal lockers some inches below, which are raised easily to any desired height by an automatic lifting device.

Tiers consist of three door-type lockers and a bottom drawer, each measuring approximately 2 feet square by 18 inches deep, giving a locker content of 6 cu. ft. There are 100 of these tiers, making a total of 400 lockers.

### AT NORMAL TEMPERATURE

Room is maintained at normal temperature, an appeal to patrons who hesitate to enter a very cold locker storage room. Locker tier is kept below floor level, except when raised for putting in or taking out packages of food, in a chest maintained at a temperature of close to 0° F.

White line across the floor marks off an extra row of 10 chest covers, beneath each of which is a tier of shelves used to hold food packages in baskets during the quick-freezing process. Section of the chest devoted to this purpose is separated from the storage section by an insulated wall, and is held at a temperature of around -20° F.

### MACHINERY ROOM

Storage chest and refrigeration machinery occupy the rear part of the store's basement. An 8-inch thickness of Armstrong corkboard is used for floor and walls of the chest, and a 2-inch thickness for the insulation of the chest covers.

Direct expansion ammonia coils provide refrigeration in the chest,

and a brine spray system is used for the cooler.

Cooler room, maintained at approximately 35° F. and equipped with overhead tracking, is located at street level and adjacent to the open space above the locker chest. Processing equipment is set up in a corner near the door leading in from the front part of the store.

A number of advantages are claimed for the new type of locker system. First is the economy of space, which adapts the system to use in retail markets, as well as in other locations where space is a factor. With the locker chest below floor level, no refrigerated space has to be wasted to provide aisles and entrance ways.

### NATURE OF CONSTRUCTION

Absence of doors leading into the locker compartment also is said to contribute to economy of operation. Insulation of walls and floor is solid and unbroken. Only one locker tier is elevated from the chest at a time; and, because of the automatic limit feature of the lifting hoist, shaft opening in the ceiling of the chest is never open.

Also, effect of wind and sun is said to be practically eliminated, because the chest is installed below ground level.

Because storage temperature is confined to the chest, below floor level, patrons of the locker plant need not dress warmly to get to their lockers. Also, there is no danger of being locked in a refrigerated room.

### COMBINED WITH STORE

Being under the same room as the store itself, the Weaver locker plant provides customers with convenient access to their lockers in the central part of town, where they are accustomed to do their shopping.

Although the plant has been in operation only a comparatively short time, it has definitely stimulated the store's retail business, Mr. Weaver reports. Extra volume has been derived from both old and new customers, he says. In addition, sales of meat for quick freezing and storage have added to the store's business.

## Plan 500 More Lockers For Tulsa Storage

TULSA, Okla.—Wide public acceptance of Tulsa's first public cold storage locker plant, Banfield Frozen Foods and Private Cold Storage Locker plant, necessitated placement of an order for 500 additional locker units, Frank Banfield reports.

Success of the plant, which was opened a few weeks ago, is attributed by Mr. Banfield in part to its central location, where it is convenient for customers to visit their lockers daily to remove foods needed for daily consumption.

The plant is featuring a sportsman's service at present on venison and elk.

## Figures Show How Community Refrigerators Proved Their Worth To Southern Farmers

KNOXVILLE, Tenn.—Rural community refrigeration, now being investigated and demonstrated by engineers of the Tennessee Valley Authority, will greatly aid in correcting the unbalanced diet of farm people, according to a recent article in Agricultural Engineering.

As many farmers in the south cannot afford individual refrigerators, it is believed that this group method of refrigeration is one means of meeting the farmer's problem of food preservation, Agricultural Engineering points out.

### SIZE AND COST

Small walk-in refrigerators, having 200 to 250-cu. ft. capacity storage space, powered by ¾ to 1-hp. refrigeration units, are located at the crossroads store or at a convenient farm. These convenient units are owned and operated by from 10 to 15 farm families. Each of these families has a cash investment of \$50 to \$75, operating expenses being not over 50 cents per month per family.

Proof that the plan was practical was supplied by the experience of one community during 1937. Meat and other products to the amount of 17,551 lbs. were cooled and stored in this community refrigerator. In addition to the 12 members, 81 other farm families used the refrigeration during the year—and rentals from the storage of the non-members more than paid the year's electric bill.

### KNOCK-DOWN CABINETS

Unit suitable to these conditions was developed jointly by the experiment station of the University of Tennessee and the TVA. The university has issued a bulletin showing how to build these community refrigerators. Refrigeration manufacturers have cooperated by offering both knock-down and assembled refrigerators.

Another phase of the refrigeration problem in the rural south is the lack of facilities to store meat at a preserving temperature. Tennessee farm people eat less than 5 lbs. of fresh meat per capita a year, the article continues, compared with 44 lbs. in Ohio. It is possible to divert hill land into profitable pasture land, but the southern farmers cannot afford individual refrigerators capable of storing carcasses of beef and pork.

### MEAT-CURING PLANT

Solution to this problem has been partially taken care of by the establishment of centrally located meat-curing plants. There are now over 175 large meat-curing plants in the south, each having refrigerating capacities of from 10 to 20 tons.

These refrigeration experiments are part of a program of electrical research devoted almost entirely to income-producing and labor-saving devices. The TVA intends to aid the farmers of that region by an intensive study of the application of electricity to the farmer's needs.

It is believed that resultant economies will enable the farmers to branch into new agricultural enterprises, make possible certain types of farming on bottom lands so that the upland can be devoted to soil-building crops, promote better crops and better incomes, and bring about living conditions which are essential in keeping the new generation of farm men and women interested in agriculture.

Farm machinery research has re-

sulted in many labor and money-saving improvements. In addition, electric brooders, hotbeds, and dairy equipment are being studied from an economic standpoint with a thought toward making electricity "pay its way" and increase farm incomes.

### FOR THE FARM

Among the electrical equipment now proving profitable to farmers are insect traps, electric sweet-potato curing and storing machine, hotbed for tomato plants, and yard lighting.

Many agencies are cooperating on the installation of the machines and are instructing the farmers as to their most profitable use. By assisting the farmer to make use of electricity in refrigeration and in other ways, it is hoped that farm incomes will be increased, and that a better living will be provided for farm families.

## Toledo Locker Storage Directs Advertising To City, Farm Users

TOLEDO—Luring prospective customers with such promised delights as "corn on the cob for Christmas," Toledo Food Lockers recently announced its opening at 321 Morris St. here as a refrigerated storage plant by an advertisement in the Sunday edition of a local paper.

This advertisement announced that the plant was "open for inspection," and that 500 lockers were available for immediate rental. Directed at "town and city folks" as well as farmers and hunters, copy stressed the many advantages of refrigerated storage, and described the facilities and services which the plant offered as follows:

"We will put your meat into the pre-chill room, then into the chill room until properly chilled and ready for cutting. For a small service charge, we will cut it into steaks, chops, roasts, etc., as per your instructions; wrap it in 100% pure parchment paper and mark according to cuts, date, and your locker number. We then freeze it in a specially constructed room at 20° below zero—this is the most important and essential step in the process.

"We will then put your meat, poultry, game, fruits, vegetables, etc., in your locker—having up to 250 pounds capacity and a temperature of 10° above zero—to which you have your own private key and access during regular business hours, 8 a.m. to 6 p.m."

As a special inducement for quick rental, the plant offered free locker rent until Dec. 1 for customers signing up for lockers during the first week of operation, only charge being a \$1 deposit for the locker key, this deposit to be refunded when the key is returned.

### Public Locker Plant Opens In Sheboygan, Wis.

SHEBOYGAN, Wis.—A public plant has been opened here by the Sheboygan Refrigerated Food Lockers, under the management of P. L. Roess. Frigidaire equipment was installed by Sheboygan Appliance Co., under the supervision of Gale Poston.

## \$100,000 Plant Opened In Madison, Wis.

MADISON, Wis.—Twentieth Century Market, Inc., formally opened its \$100,000 combination cold storage locker plant and retail food store at 1860 E. Washington Ave. here Nov. 18 and 19.

The plant has been equipped with 500 cold storage lockers which the management says have a temperature range of from 40° above zero to 20° below zero.

The company, headed by A. J. Fiore, prominent petroleum and fuel distributor of southern Wisconsin, has been organized by leading Madison businessmen. Active management of the new concern has been turned over to William Fraser and Henry L. Cass.

## 300-Locker Storage Opened In British Columbia

CHILLIWACK, British Columbia—George E. Williams has opened a new 300-locker plant here for the storage of fresh and smoked meats, vegetables, and fresh fruits. Each locker is approximately 8 cu. ft. in volume.

According to Mr. Williams, beef can be stored in the plant for a period of one year and pork for six months.



**VIRGINIA SMELTING COMPANY**  
WEST NORFOLK, VIRGINIA

**Dayton**  
**V-BELTS**

Silent, vibrationless, dependable, long-lasting. Powerful grip prevents slippage. A nearby distributor carries a complete stock for appliances and machines.

**THE DAYTON RUBBER MFG. CO., DAYTON, OHIO**  
World's Largest Manufacturer of V-Belts

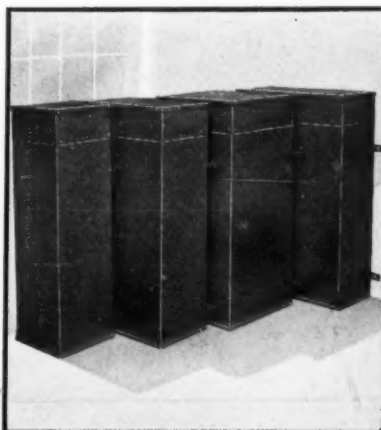
**KRAMER**  
**WATER COOLING**  
**Evaporators**  
FOR  
Vertical or Horizontal Mounting.  
SEND FOR BULLETIN No. 1037

**TRENTON AUTO RADIATOR WORKS**  
TRENTON, N.J.

Capacities from 9 to 35 gallons per hour.

Larger Capacity Water Coolers also available.

Prices on application





## Commercial Refrigeration

### Large Plant Replaced By 8 Small Units; Big Saving Realized

GRAND RAPIDS, Mich.—Operating expense reduction of about 20% has been effected in the refrigeration equipment in Hotel Rowe here by changing from a large central refrigerating plant to eight small individual units, says C. M. Courser, chief engineer of the hotel.

Original equipment of the hotel, which was built in 1922, consisted of a 30-ton horizontal, double-action ammonia compressor, belt-driven by a 50-hp. motor, two 1-hp. brine circulating pumps, and a 3-hp. belt-driven brine agitator.

Also part of the general equipment were a 10-hp. direct-connected centrifugal pump for circulating drinking water from a baualot cooler, part of the water being secured by a well pump using a 5-hp. motor; a 10-ton shell-and-tube brine cooler; an ice tank for making 48 200-lb. cakes of ice; and the necessary piping.

To reduce power load, effect a more flexible service, and insure that some refrigeration would be available at all times, as well as to remove the hazard of having 1,000 lbs. of ammonia in the system, it was decided to install small individual units.

Eight automatic methyl chloride units ranging from 1/4 to 3 hp. replaced the old central system.

To illustrate how much of an improvement this has been, Mr. Courser said that where formerly it was necessary to operate the compressor the greater part of the time during warm weather to maintain a temperature low enough for the sharp freezer, a 2-hp. unit now does the job more satisfactorily.

Before, Mr. Courser also pointed out, the power utilized to keep the ice from melting exceeded the demand.

With the old huge system, if any major repair had to be made it was necessary to shut down the entire plant, leaving the hotel stranded without refrigeration. It is very unlikely that all of the small units will be out of order at the same time, said Mr. Courser.

### McGregor Dealers Get Data on Locker Field

MEMPHIS, Tenn. — Commercial sales engineers of McGregor's, Inc., distributor, and Frigidaire dealers from the Memphis area attended an all-day meeting in the Chisca hotel here recently to familiarize themselves with installation and operation of refrigerated food locker systems.

John M. McGregor, head of the distributorship, was in charge of the meeting, and Earl L. Mohr, vice president and sales manager of Master Refrigerated Locker Systems, Sioux City, Iowa, was a speaker.

Other speakers at the meeting included: Earl Spriggs, Frigidaire commercial zone manager; J. O. Harvey of Dole Refrigerating Co., Chicago; Bob Snowden, Arkansas planter; and E. M. Barlow, commercial sales manager for McGregor's.

### Blowers Used In Mills Hardening Cabinet

CHICAGO—Using a forced-convection type of refrigeration system, the new "Master" ice cream hardening cabinet introduced by Mills Novelty Co. is so constructed that different temperatures ranging from the hardening temperatures to temperatures for dispensing and frosted malted storage may be maintained at the same time.

The evaporator on this new cabinet consists of one continuous coil along the front side of the cabinet so that forced-air circulation can be employed for the purpose of rapid hardening. Four blowers connected on a single shaft, located along the front of the cabinet below the coils, provide the forced-air circulation.

According to Mills officials, with forced-air hardening the customer will be able to harden cream in approximately one half the time required in the old system of hardening. It is necessary to leave a slight air space between carton goods that is being hardened.

The cold control of this Master hardening cabinet has a differential of about 5 to 7° F. It can be set at any temperature from -22 to 40° F., thus making it convenient for the customer to maintain any desired temperature in the cabinet.

The indicator or handle on the dial makes two complete turns from low temperature to high temperature. This feature coupled with the blower shutters makes it easy for the customer to obtain even wider ranges of temperatures within the same cabinet.

By restricting the blower vents, it is possible to maintain three different temperatures in the 60-gal. cabinet at the same time, plus the mix storage temperature.

When the cabinet leaves the factory the control is set at dispensing temperature for bulk ice cream (dispensing temperature for normal ice cream formulas should be between 0 to 5° F.). When cream is to be hardened, it is not necessary to disturb the setting of the cold control. The rapid timer for hardening can be set without any relation whatsoever to the cold control.

The rapid timer for hardening cuts off the thermostatic control or the cold control and allows the compressor to operate continuously or to a point at which the low-temperature control was set.

With the use of the forced-air circulation, defrosting is required at regular intervals so that the frost accumulation of the coils will not restrict the air circulation and the heat transfer.

The mix cabinet temperature is controlled by a shutter restricting or opening a non-insulated portion leading into the adjacent compartment. The temperature is controlled by opening or closing the shutter to maintain the desired temperature as indicated on the outside panel temperature dial.

The temperature dial indicator on the master cabinet is distinguished by the fact that the actual figures in degrees have been left off of the dial and replaced by zones. These zones are identified in reference to temperature as follows:

The lower zone, or the hardening zone, takes in a range from top to bottom of -5 to -30° F. The top zone, or dispensing zone, takes in a range from 0 to 10° F. The next zone labeled "Frosted Malted" takes in a range of 15 to 25° F. for soft ice creams, malted milk, and custards. Another zone labeled "Mix" takes in a range from 30 to 50° F.

To maintain different temperatures in individual compartments, the blower shutters are regulated, higher temperatures being obtained by restricting the blower vent.

### Dealer Sees New Field In Case Sale To Drug Store

PORTLAND, Me.—By selling a 10-foot commercial refrigerator display case to a drug store, A. F. Briggs, local dealer for Sherer-Gillett commercial refrigerator equipment, Mills refrigeration compressors, and a full line of meat market essentials, has opened up a new field of prospects for himself.

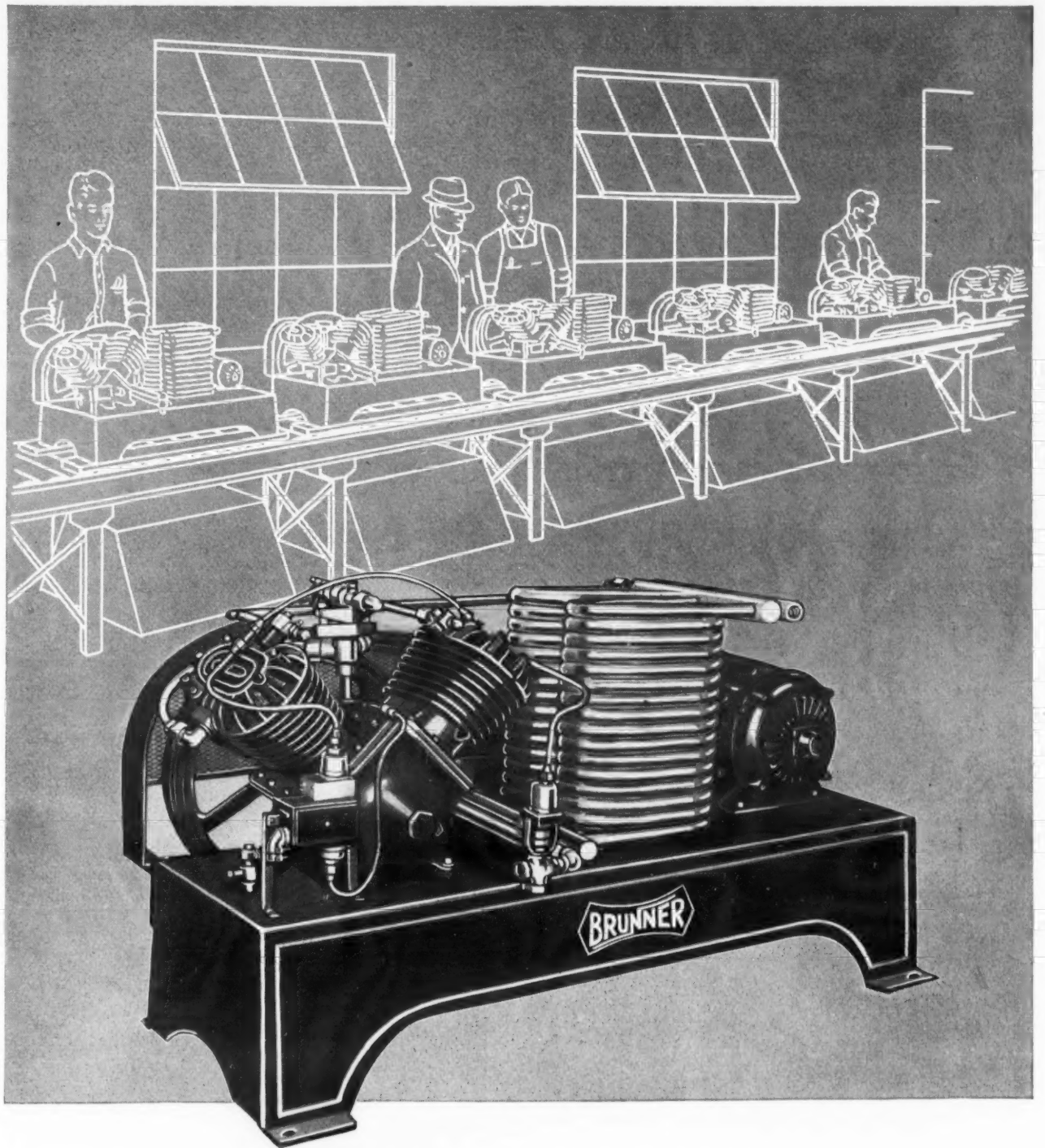
Mr. Briggs sold the 10-foot case to Canavan Drug Co., which used it

for an attractive display of canned beer. Joe Canavan, store owner, also is using the broad, flat top of the case for a display of beer cans.

Success of its first beer display has prompted Canavan Drug Co. to order a 6-foot case for a display of refrigerated bottled beverages.

Mr. Briggs now is staging a concentrated drive to sell display cases to other drug stores.

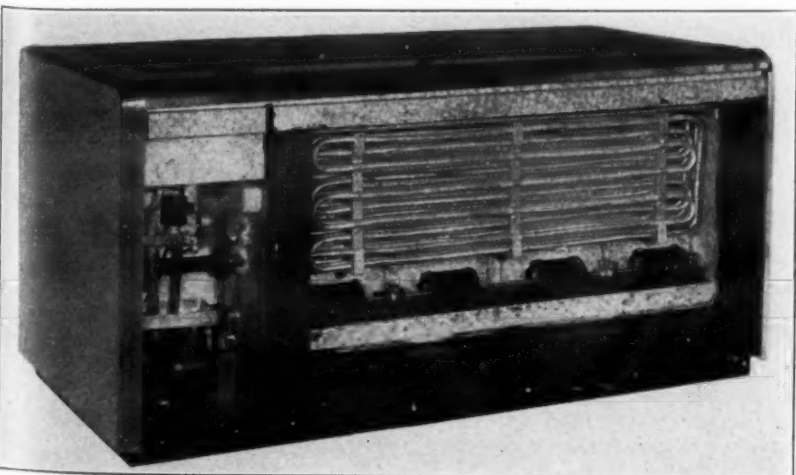
In keeping with his ideas for expansion, Mr. Briggs recently moved his sales and display headquarters to larger premises at 206 Federal St.



## THE ALL-IMPORTANT "TRIAL RUN" IS UNDER THE EYES OF EXPERTS

Condensing units are like human beings in this respect: during the first hours of existence they need the care and attention of specialists. That is why the Brunner assembly and run-in is so elaborate. Every last detail of construction is checked while the unit operates under actual service conditions. Alignment of all parts—shaft, bearings, pistons—is made certain. Valves are studied for quietness and for seal. The lubrication system checked. Then—if the unit in final tests measures up to the Brunner requirement for refrigerating efficiency—it receives the Brunner nameplate and is ready for the "firing line" of duty...Why not get the whole Brunner story? See how Brunner engineering has put mechanical refrigeration on a more dependable basis. The Brunner line comprises Brunner Refrigerating and Air Conditioning equipment, air and water cooled, from 1/4 to 15 H.P. Catalog on request. Brunner Manufacturing Company, Utica, N. Y., U. S. A.

### Forced-Convection Cooling In New Use



New Mills ice cream hardening and dispensing cabinet, with front panel removed to show location of the blowers and coil.

IT'S **BRUNNER**  
FOR *economical* SERVICE



# Chicago Symposium Reveals Revised Thinking on Many Phases of Air Conditioning

## Reactions of Users Indicate 'Comfort Chart' Settings Are Too Low To Be Satisfactory

"There is no one right or wrong method of air conditioning applicable to all comfort projects," declared Charles S. Leopold, Philadelphia consulting engineer, speaking on "Engineering Aspects of Air Conditioning for Comfort," at the public symposium held Nov. 22 in the Western Society of Engineers Auditorium in Chicago.

"No proper solution of any given problem can be obtained," Mr. Leopold said, "without due regard to the size and shape of the building, the peculiarities of architectural design, availability of natural resources such as well water, the structure of local utility gas, electric, and steam rates, an estimate of the reasonable expectancy of the life of the building, and due consideration to the personalities involved."

### COMFORT IS 'PASSIVE'

Mr. Leopold bases his theory for the design of any air-conditioning system on the fact that comfort is passive; discomfort is active, and that with successful air conditioning, the occupant is oblivious of his atmospheric environment.

Where operators of air-conditioning systems attempt to make comfort an active sensation, the result is discomfort. Mr. Leopold cited theaters as a case in point, where the operator attempts to maintain a temperature which "feels" cool, with resultant discomfort to the patrons.

For rooms of single occupancy the speaker recommended the use of individual controls, which will satisfy people with an abnormal temperature response, and in addition will allow the individual to strike a balance between his mental and physiological response.

### USERS 'UP' TEMPERATURE

"In office building practice, where individual control has been provided and where the occupancy of a room is usually two or more, I have found that the majority of office workers set the thermostat between 75 and 76°, with a dewpoint that will give a resulting 50% relative humidity," Mr. Leopold said.

"Commercially, in summer conditioning of an enclosure in which an appreciable number of people remain in a conditioned space for hours, most satisfactory conditions are obtained with relative humidity of from 30 to 55%, provided the dry bulb and air motion are properly compensated. Assuming 50% relative humidity and air motion of 15 to 25 feet per minute, optimum results are secured from 76 to 77½° dry bulb, and satisfactory results are secured from 76 to 79°.

### ON 'HIGH' SIDE OF CHART

"The fact that these desired temperatures are on the high side of the optimum shown in the comfort zone is probably due to inaccuracies in our control of air motion and the fact that people are more tolerant of a sensation of being slightly too warm than they are of being too cool.

"The present design standard of 80° and 50% is a high limit and is generally not satisfactory for office buildings or other enclosures used for

extended occupancy. I believe an effective temperature corresponding to 78° and 50% is a more desirable upper limit for summer design. For winter operation, an effective temperature corresponding to 70° and 50% is desirable but, due to problems of condensation, winter indoor humidities seldom can be maintained as high as 50% and temperatures well over 70° are usually required.

"The blind adherence to a 70° temperature, regardless of humidity, has been the cause of much discomfort with installations which are capable of giving satisfactory results.

### A NEW OPTIMUM

"For office buildings and similar enclosures, where people are in conditioned space for long periods of time, it has been found that the summer conditioning period can be spanned with a variation of effective temperatures from 75 to 78°, at 50% relative humidity.

"Much has been said and comparatively little demonstrated on the so-called 'entrance shock,' a term used to describe the sensation of coldness, whether pleasant or unpleasant, noted for a short time after entering an air-conditioned building.

"As far as I know, no experiments to date have demonstrated harm occasioned by this sudden change in temperature sensation and plausibility is not sufficient for, to be consistent, we would have to investigate the effect of a shower bath.

### ONE MAIN PURPOSE

"The purpose of comfort air conditioning is expressed in its name and although it is absolutely essential that results be obtained which will not harm the health of the occupant, it is not essential that conditioning shall result in improvement in health, although this latter is highly desirable and, in many cases for people of poor health, has shown this ability.

"Positive results have been obtained in incubators and in certain diseases, such as the diarrheal diseases of infancy. Exceptional results have been obtained in the alleviation of allergic disorders caused by filterable air-borne allergens.

### EXPECT TOO MUCH

"From a report on the health of employees of the Metropolitan Life Insurance Co. of New York, we may fairly conclude, from a comparison of the two groups—one working (for 22.3% of the week) in an air-conditioned building and the other for the same period in a non-conditioned building but under reasonably comfortable conditions, that air conditioning has not shown any measurable effect on the incidence or duration of absences for upper respiratory infection or of non-respiratory illnesses.

"It is not surprising that the exposure to conditioning should fail to show a noticeable improvement over a similar group working in unconditioned but otherwise better than average environment, but if there were a disadvantage occasioned by entering or leaving the conditioned space, the result should have shown in the test.

"The general object of air-conditioning design is to accomplish the

desired result at the most economical owning and operating cost.

"Separate apparatus may be used for the drying and cooling functions. For drying, systems are sometimes used in which the air comes in contact with a strong salt solution, which has the property of absorbing moisture in the same manner that pure table salt will absorb moisture and finally become fluid.

"An alternate method of dehydration is by means of solid matter, such as Silica Gel or Activated Alumina, which materials have millions of sub-microscopic pores which have the property of absorbing the water vapor from the air. In either dehydration process, moisture removal is accomplished by a corresponding release of sensible heat, and apparatus must be provided for its removal.

### WHERE DRYING AGENT IS USED

"When either of these methods is used, the material can be reactivated by the use of sufficient heat to boil off the accumulated water. With these methods, the cooling is separately accomplished, either with evaporation of cool liquids produced by a refrigerating machine, or, in some locations, by the use of well water flowing through coils over which the air stream is passed.

"The selection of a system having separate means for drying and dehydrating depends largely on local conditions. In making a comparison of over-all costs of split systems as compared to straight refrigeration, it is not sufficient to consider the owning and operating cost of the drying and cooling means alone, as there is considerable difference in design and cost of construction throughout the entire system.

"In Lincoln, Neb., the Gold department store uses Silica Gel for drying and well water for cooling. Silica Gel was chosen for this job partly because natural gas was available at 28 cents per 1,000 cu. ft. The gas is used to dry the Silica Gel.

"In Sioux City, the Davidson Bros. department store uses lithium chloride as an adsorbent and well water for cooling. The lithium chloride apparatus is regenerated by steam. In both cases utility rates and the availability of well water for cooling contributed to the desirability of this type of system from the standpoint of both owning and operating cost.

### IN A HOTEL SYSTEM

"In the bedroom conditioning system of the Palmer House, fresh air is dried to the requisite dryness by lithium chloride and the air is passed to fan and coil units, which causes this super-dried fresh air, mixed with return air from the corridors, to pass through individual heating and cooling coils, and an individual duct to each bedroom so that the occupant can control the temperature of his room summer and winter, without affecting the total amount of air supplied to the room, the total amount of fresh air supplied, or the moisture content.

"In the customary refrigeration systems where drying and cooling are accomplished simultaneously, it is reasonable to expect that conditions will arise where there is a peak demand for drying effect and less than a peak demand for cooling, or vice versa, so that if too simple a system is used, it is very possible to over-cool in the effort to dry the air, or to over-dry in the effort to cool the air.

"Usually in comfort work where refrigeration is used for both drying and cooling, the air passing through an air washer must be reduced to a temperature in the low fifties. To transmit this air without excessive heat loss, or to introduce it into a room without causing draft, is a difficult problem and frequently one

## Some New Information Is Turned Up

**Editor's Note:** At the symposium on "Air Conditioning for Human Comfort" held last week in Chicago before more than 900 dealers, contractors, engineers, architects, and others interested in air conditioning, discussions of many phases of the subject were given by recognized authorities.

Some of these talks are reported on this and the following page. Others are included in Editor George Taubeneck's story of the symposium which starts on page 1 of this issue. Still others may be published in a later issue.

Information given in these discussions is new and authoritative, and should interest everyone who is building, selling, engineering, or installing air conditioning.

that is best solved by mixing the cold dry air with some additional return air from the room, which serves to give a larger total supply at a higher temperature. This is known as bypassing.

"By careful design of the air-distributing system, satisfactory results can be obtained by using a fixed bypass and reducing the air quantity as required by an appropriate maximum of 25%. In many enclosures, the internal load is such that this will give satisfactory results for a large part of the summer.

### ABOVE THE DEWPOINT

"When cooling coils are used in lieu of an air washer, by proper selection of velocities, coils, and fin space, even though all of the air be passed through the coils, a sensible temperature of the air leaving the coils can be obtained which is substantially above the dewpoint. That is to say, the air will not emerge in a saturated condition and it will be possible, with the same design effect, to have a greater quantity of air at slightly higher temperature.

"With an air washer a comparable result may be obtained by using a coarse spray instead of a fine mist. The trade name for this process is 'Partial Saturation.' The practical degree of reheat by these two methods is limited to approximately 5° and is a variable depending on the condition of the outside air.

### 'RUN-AROUND' CIRCUIT

"Where all of the air is to be passed through the dehumidifier a very satisfactory result can be obtained by use of the so-called 'run-around' circuit, in which extended surface coils are placed before and after the dehumidifier and connected by their own liquid circuit, including a small pump.

"In this method, air and water are kept in counterflow and heat subtracted from the entering air service to reheat the cold air emerging from the washer. Where there is danger of excess moisture infiltration in the return air stream, such as would be caused by open windows or doors, this method is very effective as compared to a bypassing method as all of the return air passes through the dehumidifier and the possibility of bypassing moisture is avoided.

"With this method it is possible to combine fresh air and return air ducts into a single shaft. Since all of the air is dehumidified, there is less difference between the dewpoint at the apparatus and in the conditioned room, so that a higher dewpoint may be used.

"This method is used in the United States Capitol, where the final control of the individual room temperature is accomplished by booster heaters. By using this system the return air system was greatly simplified and this was of extreme importance because of the unusually massive masonry construction.

"In the old House Office building, this method was used on the north

exposure and the bypass controlled by temperature of fan discharge, was used on the three sun exposures. On all exposures, final room control was obtained by booster heaters."

## Henderson Outlines Some Of Problems Faced By the Industry

The architect should take the time and trouble to familiarize himself with air conditioning, so that he may be able to judge it as competently as he appraises a house foundation, William B. Henderson, executive vice president of Air Conditioning Manufacturers' Association, told the symposium "Air Conditioning for Human Comfort" assembly here last week.

"Too many of the fraternity seek to cover up their own ignorance of the subject—and their own laziness to learn something of it—by telling clients that air conditioning is a 'passing fancy,' 'in its infancy,' or some other cock-and-bull story, when the reverse is clearly obvious to even a high school freshman," Mr. Henderson said.

Explaining that in the public mind air conditioning was closely associated with comfort cooling, but in reality was a year-around function, Mr. Henderson went on to point out that introduction of portable store-cooling units had done much to meet the cost and installation demands of store owners in the medium and small classes.

The "Better Light, Better Sight" movement, which has made much headway during the past few years, also has presented somewhat of a poser to the air-conditioning industry, he continued.

"More light often means more heat," he said. "In the summer months, this can place an unforeseen burden on the air-conditioning system, which may have been installed for a lesser number of B.T.U. of lighting load. You as architects and we as suppliers of air conditioning should be certain of the lighting load contemplated by the client for the immediate future."

He also recommended the use of blues, greens, or similar soothing colors in interior decoration and lighting, saying that investigation had shown that clients felt much more comfortable in surroundings of this type than when yellow, red, or other high-colored lighting was employed, even when temperature, humidity, and air changes are about the same.

"Then the air-conditioning industry was accused of creating a water supply and disposal problem. The industry has been foresighted enough to see the possibility of such a situation developing and had perfected water-saving devices such as the evaporative condenser, which re-uses over 95% of the water.

"Over-cooling is a problem to the air-conditioning industry because too many owners and operators of air-conditioning equipment have a small-boy tendency to 'show-off.' They want the whole world to know they have air conditioning, and, in the process, make their premises uncomfortable for the occupants. This is particularly true of theater operators and the smaller retailers.

"Careless handling of humidification by poorly-trained, uninformed, or profit-greedy installers has contributed to the failure of not a few installations of winter air conditioning to come up to what is to be expected."

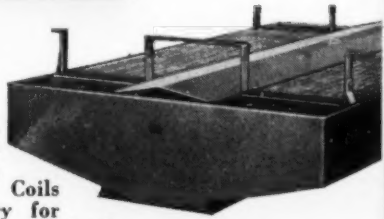
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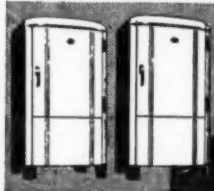
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## Factory Engineer, Once With Architect, Offers Ideas For Both Architects & Engineers

The phases of air conditioning that an architect must know best, and the things he can do to make an air-conditioning system function better and cost less, were described at the "Air Conditioning for Human Comfort" symposium held Nov. 22 in Chicago, by Albert Buenger, engineer for the Delco-Frigidaire division of General Motors Sales Corp.

It has been Mr. Buenger's privilege to view air conditioning, first from the standpoint of the architect (he was associated for a number of years with an architect's office), and second, from the viewpoint of the manufacturer of air-conditioning equipment.

"The architect's problems with air conditioning may be classified as coming under three general headings: the design of the system within the conditioned space; the selection and location of equipment for the system, and finally the service requirements," declared Mr. Buenger.

"Design of the system itself is different from most heating and ventilating systems because of the introduction of cooling and dehumidification for comfort air-conditioning installations. This discussion is confined to the cooling phase of the problem.

### AIR DISTRIBUTION PROBLEM

"The handling and distribution of air within the conditioned space is probably the least understood phase of air conditioning. For the past three years no outstanding changes were made in the chapters of the A.S.H. & V.E. Guide on the subject. The reason is that the industry itself is not ready to set down final conclusion on this point. However, we do not know that cooled or cold air acts entirely differently in an occupied space than warm air does.

"Cold air, as a rule, cannot be satisfactorily introduced laterally into an occupied space below the tops of the occupants' heads without producing drafts," Mr. Buenger continued.

### HIGH REGISTERS

"This is the reason for high register locations in air-conditioned rooms. The location of air inlets and outlets is consequently of prime importance. A compromise between the aesthetic and engineering requirements must frequently be made.

"The heavily ornamented cast metal or plaster grille is frequently not suitable for proper cold air diffusion.

"There are no fixed rules to be followed for the transmission of the conditioned air to the space to be conditioned. The one thing to be remembered is that space must be provided for supply and return air ducts and flues from the equipment room to the space to be conditioned. The ducts may be exposed or concealed as the building requirements demand.

### DUCT INSULATION

"Cold air ducts, however, frequently must be insulated. For several reasons; first, to prevent heat gain, then to prevent condensation on the outside of the ducts where the conditioned air temperature is below the dewpoint of the surrounding atmosphere; and finally, in some cases, to eliminate noise transmission from the equipment room to the conditioned area.

"The equipment room itself presents many problems. It is important that sufficient space be provided, not only in order to house the equipment, but also in order to permit for economical duct arrangement and easy maintenance.

"As much of the equipment is rotating or reciprocating and is fairly heavy, proper structural supports must be provided. Where compressors are located on upper floors of buildings, the supports must be ample to carry the weight, and proper provisions must be made for sound insulation.

"Whether the service requirements should concern the architect may be questioned, but ample water, waste, and electrical connections are most important for the successful operation of an air-conditioning system."

These and many similar construction problems arise on each air-conditioning system, Mr. Buenger pointed out. However, there is a problem of a different kind with which the architect is even more concerned, he said, and that is costs.

"The architect's budget or building appropriation is usually limited; it is, therefore, highly important that the architect be fully informed on air-conditioning costs," declared Mr. Buenger.

### ESTIMATING COSTS

"That there is no short cut, no royal road to easy estimating of air-conditioning costs, is apparent to anyone familiar with building construction. Accurate estimates can only be arrived at by a careful assembly of labor and material costs. This should include all trades involved, such as sheet metal, plumbing, heating, refrigeration, etc.

"However, experience has given us some 'yardsticks' of measurement based on the 'ton of refrigeration.' These costs are variable according to the size of the job as follows:

1 ton .....	\$500
2 to 3 tons .....	\$400 per ton
3 to 9 tons .....	\$325 to \$375 per ton
10 tons and above .....	\$225 to \$350 per ton

"This is equipment to \$1.00 to \$1.50 per square foot of conditioned space.

"The recent introduction of unit equipment has tended to bring down air-conditioning prices.

"As proper provision by the architect can materially reduce the cost of air conditioning, it is worth while to investigate what construction factors may influence the load.

"The load is affected by the heat gains through the building construction, by sun exposure, the number of occupants, the lighting and heat producing equipment in the building, and the amount of outside air introduced into the building.

### COST REDUCTION MEANS

"In order to reduce costs, we must look for ways and means of reducing the load. Suppose, for this discussion, we assign a dollar value to the load by assuming that each ton costs \$300. We can then discuss load in terms of dollars in place of tons.

"The heating industry was quick to take advantage of insulation of buildings. To the cooling industry it is equally important. For example, insulation equivalent to 4 inches of rock wool will reduce the load \$75 per 1,000 square feet of wall.

"Sun exposure is a major item in most cooling installations. The sun effect can be reduced by cutting off the sun's rays by shades or awnings. The installation of awnings will reduce the costs as much as \$4.00 per square foot of window exposed to the sun.

### EFFECT OF PAINTS

"Much has been said about the effect of paints on sun and heat reflection. The method of reducing the heat load by reflecting paints still is good, but recently published tests show that unless the surface is white or nearly so, the reduction is not as much as formerly was supposed.

"Many buildings with flat roofs offer the possibility of evaporative cooling. The use of water sprays or sheet of water has the effect of practically eliminating 100% of the sun exposure. The cost reduction may

be as much as \$200 to \$300 per 1,000 square feet of roof.

"Here, problems are encountered in roof construction, as not all roof construction is suitable for roof sprays. For example, tar or pitch is preferable to asphalt, as the latter tends to rot when submerged constantly.

"It is further of importance that an accurate count or estimate be made of the occupants of the space to be conditioned. True, the architect has no control over the people who will occupy his building, but he should make every effort to determine the number of occupants, as a saving of \$10 to \$12 can be effected if more persons stay out of the building.

### WATCH LIGHTING LOAD

"Reduction of the lighting and electrical appliance load will reduce the air-conditioning costs to the extent of \$9.00 for each 100 watts. (To introduce a word of caution here, frequently installations of air conditioning in existing buildings will influence the owner to make improvements in lighting systems, which will have its effect on the air-conditioning load.)

"Finally, the load may be reduced by removing some of the internal heat by proper ventilation. Kitchen equipment, such as coffee urns and steam tables, are most susceptible of this type of improvement. Here again a word of caution is in order, as each 100 c.f.m. exhausted must be replaced by a like amount of outside air, and that means \$85 for each 100 c.f.m. of air introduced.

"Assuming that we have reduced our loads to a minimum, how can we further reduce the costs? It is with

some hesitation that I am making suggestions here, as most architects are past masters at economical building design. Nevertheless, there are a few points worth mentioning.

"The first and most obvious one refers to the location of the equipment. If this can be in or near the air-conditioned space, real savings can be made. As has been intimated above, if the space lends itself to self-contained unit installation, this form of air conditioning is ideal from the standpoint of economy.

"If this is not possible, we must try to keep the air-conditioning unit close to the compressor and both close to the air-conditioned space. This eliminates long refrigerant, duct, and service runs.

"It is important that the duct layout be economical. Modern engineering has been responsible for long throw, high velocity grilles, circular venturi type ceiling outlets, and other improvements. All of these may be used to reduce duct costs.

### STANDARDIZATION COMES

"Reduction of costs by reducing the load, as outlined, does not necessarily mean that any one trifling reduction of the load will reduce the cost of the contract a corresponding amount. The careful attention to all of these details may produce a cumulative reduction in the estimate which will frequently permit the selection of smaller equipment with consequent reduction in costs. In other words, air-conditioning equipment comes more or less in standard sizes.

"In discussing cost reduction up to this point, we have been interested in first costs. However, the owner, or ultimate consumer, is frequently

interested more in operating costs. The load reductions recommended above, however minute, have a definite relationship to the operating costs of the system, so that regardless of the saving in first cost, actual reduction of load will cut down operating costs in direct proportion.

"Though air conditioning may have its complications and problems for the architect, it also has compensated him by stimulating many a new building project, by interesting a client in extensive remodeling, by making available spaces for occupancy which otherwise would have been impossible to use."

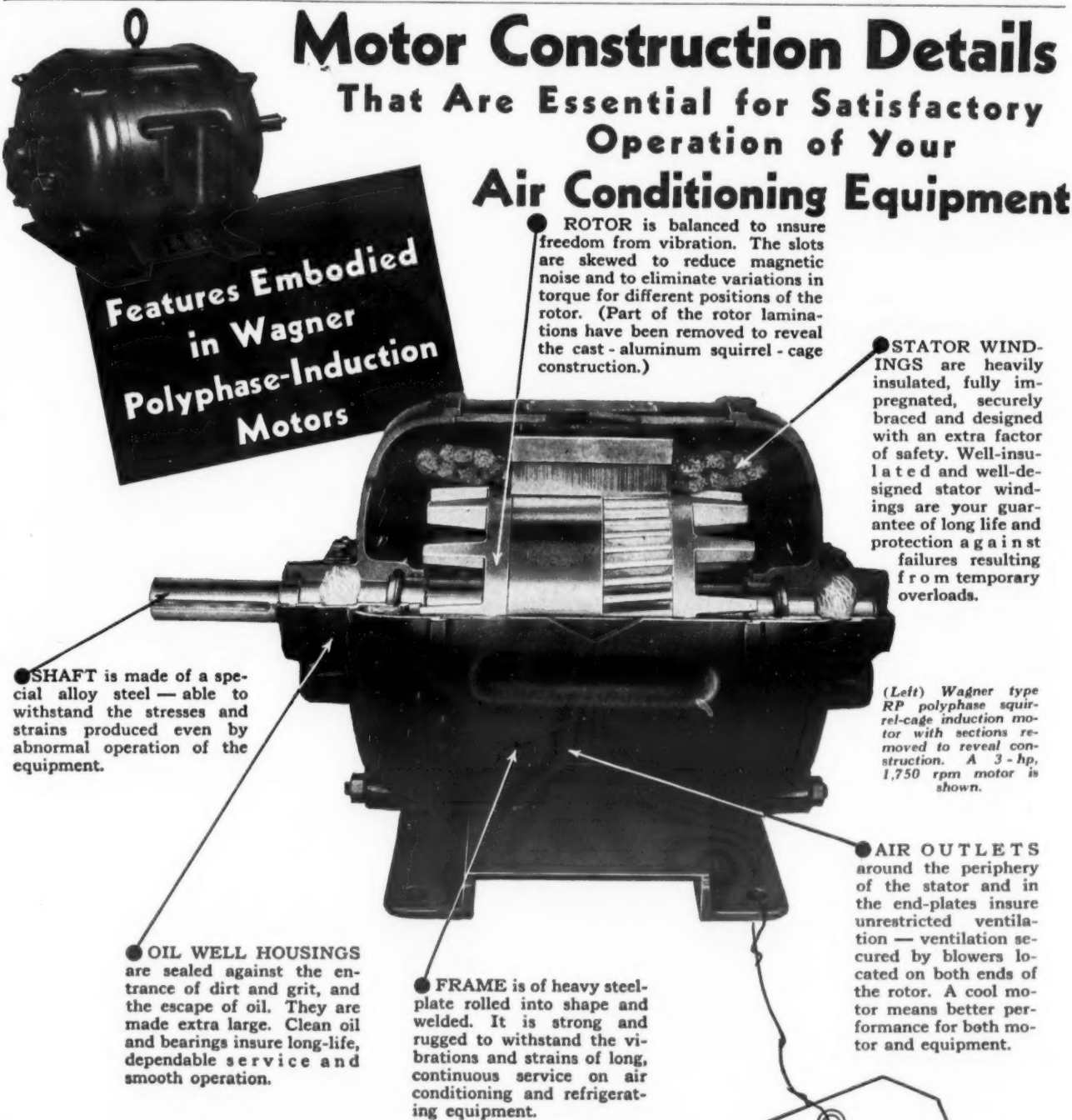
## Tax Proposed on Use of Sewers For Well Water

MILWAUKEE—Imposition of special sewer charges against firms having their own water supplies is provided by an ordinance introduced before the Milwaukee Common Council by Alderman August J. Abe.

According to Assistant City Attorney Ronald A. Drechsler, the ordinance would affect commercial buildings using large amounts of water for air conditioning obtained from private wells, and factories using large quantities in production processes.

The ordinance, which does not set rates, was described as the first of its kind in the United States. It would not affect firms within the city limits which obtain their water from the municipal waterworks, but would affect suburban firms using the city sewer system, regardless of the source of their water supply.

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## 'Show-offs' Hurt Air Conditioning

WILLIAM B. HENDERSON, executive vice president of the Air Conditioning Manufacturers' Association, and President Willis H. Carrier of Carrier Corp.—two men who should know, if anyone does—claim that "show-offs" are giving air conditioning a bad name with the public.

These "show-offs" can be divided into two classes:

(1) *Installers*, who want "sample" installations to show prospective customers, are inclined to overengineer such installations so that prospects taken to them will be immediately impressed with the fine job of temperature reduction done.

(2) *Operators*, having invested a considerable quantity of money in air conditioning, want their customers and friends to know at once that their place is really air conditioned. Hence they are prone to reduce the temperatures to an excessively low point in the summer.

Mr. Carrier also points out that both owners and their employees, spending as they do an entire day in the air-conditioned space, become accustomed to temperatures and humidities which seem objectionable to those who come into the space only for a short time.

As a result, a great many people have come to believe that air-conditioned stores, theaters, trains, and restaurants are "too cold and clammy." Hence residential air conditioning has been stymied.

### 'Comfort Chart Misnamed', Declares Willis Carrier

Too rigid adherence to set formulae of temperature and humidity designed by engineers and scientists may also cause complaints. Mr. Carrier points out:

"The so-called A.S.H.V.E. comfort chart is really misnamed. What this chart really does is to give the lines of equal temperature sensation, but summer discomfort comes as much from excessive moisture next to the body and in

the clothing as it does from a sensation of warmth. High atmospheric humidities may evaporate nearly as much moisture from the body as low humidities at the same room temperature; but this alone is not the criterion of comfort.

"With high humidities the effect is to condense moisture in the clothing. This is especially noticeable where people are coming immediately inside from out-of-doors, and therefore perspiring freely. In such cases the clothing at once becomes highly conductive, and a chill is frequently experienced when temperatures are carried too low.

"This is a complex subject only recently given the study it deserves."

### Comfort Requires Close Humidity Control

Mr. Carrier believes that humidity control is not given sufficient attention by operators and installers alike. Comfort is more likely to be related to humidity than to temperature, in his opinion.

To "show-off" operators, it can be pointed out that lower-than-necessary temperatures increase operating costs, as well as drive away customers. And since the big idea is to make customers comfortable, attention should be paid to how they feel, and regulation of the controls should be made accordingly.

Mr. Carrier sums it up admirably as follows:

"The ideal air-conditioning system is one in which the occupant will scarcely be conscious that the space is air conditioned. He will merely realize that he is quite comfortable when the matter is called to his attention."

## Don't Leave the Job To the Politicians

ADVERTISING AGE editorialized recently regarding some uncomplimentary remarks concerning trade publications serving the advertising fraternity which were made by an advertising agency executive in a lecture sponsored by the Chicago Federated Advertising Club.

We do not know what the advertising man said in his talk to other advertising men but we are somewhat surprised by the editorial comment of this advertising publication, particularly the following paragraph:

"In spite of this perhaps justified feeling of resentment, we believe that it is a mistake of policy for the head of a leading advertising agency publicly to make remarks of a disparaging character relative to the advertising press. The same would be true of any publisher or other media owner; in fact of any one who directly or indirectly gets his living from advertising. The advertising field is well served by its business press, and with due regard to the high standards of business journalism practiced in other lines, it can fairly be said that advertising publications as a whole are far above the average."

It seems to us that there is something radically wrong with the theory that a business man, talking to other business men in his own field, should not express his opinions regarding anything

which he considers wrong with that particular line of business.

Who has a better right to express his opinions about a business than a man who gets his living from that business, and who should be more concerned about anything which affects the present practices or future possibilities of that business?

In our opinion, too many business men have failed to use their influence against improper business practices in the past with the regrettable result that we now have too many politicians making laws to regulate the detailed operation of business.

The politicians have largely succeeded in justifying their crude and unintelligent regulations of business by the argument that such measures are necessary in order to eliminate evil practices.

## LETTERS

### Information Sought on Dealer's Costs

Southern Specialty & Fixture Co.  
Kuhrt Bros. Engineering Co.  
318 Broughton St., West  
Savannah, Ga.

Editor:

We are interested in securing a break-down or the balance sheet, showing in detail the various items of cost with reference to retail electrical appliance dealer, either of the average dealer, or of a model dealer operating at a profit.

We would like the above sheet for the purpose of comparison or something that we could use as a guide in checking the various costs.

If you do not have anything on hand such as this, perhaps you could tell us where we could secure same. We will appreciate your advice in this connection.

P. T. KUHR

Answer: We have published a number of pieces of information which might help you to check the operating costs of a retail appliance dealer.

In the May 4, 1938 issue of AIR CONDITIONING & REFRIGERATION NEWS, there was published an article on accounting procedure for the appliance dealer, which sets up a model system of accounting and explains each of the items that are to be included in such a system and the various costs that are to be charged.

Early this year, we published a book, "Appliance Selling Today," which is designed to give the retail appliance dealer sales ideas taken from the actual experiences of dealers in the field. In the book's appendix is an analysis of operating expenses for electrical appliance and refrigerator stores compiled from a survey of 415 electric and gas household appliance stores made by the Dun &

## They'll Do It Every Time . . . By Jimmy Hatlo



THANK TO W.M.F. - CHARLOTTE, MICH.

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Bradstreet Research & Statistical Division. We are sure that you will find this of interest.

In the Nov. 23, 1938 issue of the News (page 4), there is an article about a series of letters from the Greusel Distributing Co. of Milwaukee to their dealers telling them about the cost of doing business in a dealer store. These letters are written from the standpoint of trying to get the dealers to sell their merchandise at full price.

Back issues of the News are available at 20 cents each. "Appliance Selling Today" is priced at \$1.00; however, it may be secured free of charge with a year's subscription to AIR CONDITIONING & REFRIGERATION NEWS (\$4.00 per year).

### Held Audience Spellbound

Wolverine Tube Co.  
1411 Central Ave., Detroit

Publisher:

Although I did not have an opportunity to attend the Detroit Chapter A.S.R.E. meeting which was held at your office Tuesday evening, Nov. 15, I have heard many good reports regarding it.

Advance notice of this meeting was so appealing to us that our factory manager took four of his operating men with him in order that they could get first-hand information on the manufacture of finned coils.

In addition to this, the lecture by Dr. Bion East must have been intensely interesting, because I understand that he talked for something over an hour and held the entire audience practically spellbound.

You are to be congratulated on helping to promote such a fine educational program with the Detroit Chapter. There should be many more such meetings, and it is our hope that you will continue to give the A.S.R.E. your continued cooperation.

J. D. COLYER,  
Vice President

### England & U. S. Should Be Better Neighbors

Hinsdale Mfg. Co.  
249 N. Wolcott Ave., Chicago

Editor:

Having just returned from a trip to Europe on a survey of the refrigeration market, it is my opinion that Mr. Taubeneck's comments in the publication, "Around the World with a Candid Camera," should be thoroughly read by everyone who receives it, especially those who are not familiar with the countries he describes so thoroughly.

It would be the writer's opinion that if some plan could be worked out whereby more Americans would visit England each year and more English people visit the United States both would be benefited immensely by same.

F. W. MILLER,  
President

### Business Better In San Joaquin Valley

Valley Refrigeration Service  
Hot Service on Cold Problems  
250 North E. St., Tulare, Calif.

Editor:

We have been readers of the News for the past four years and find it

to be indispensable in the refrigeration business.

Your articles on the recent Dairy Industries Exposition at Cleveland interested us very much. We are writing several companies concerning frosted food cases and would like to inquire about those of the Charles Q. Sherman Corp. but are unable to find where they are located. We would appreciate it very much if you would address the enclosed envelope properly and forward it for us.

We have been located here in the San Joaquin Valley for the past seven months and are glad to say that our business has been much better than we had anticipated.

ROBERT C. FISH, Mgr.

### Clark Is Chairman Of Plan Committee

Western Union Telegram  
New York City

Please make following correction in caption of photograph of Lee Clark sent you this week. "Will become chairman of the plan committee of The Modern Kitchen Bureau" instead of "chairman of The Modern Kitchen Bureau" as caption sent you reads.

GARDNER BOYD,  
The Modern Kitchen Bureau

Editor's Note: This telegram arrived too late to permit a correction to be made in the caption under Mr. Clark's picture which appeared on page 1 of the Nov. 23 issue of the News.

### Plans To Use Article In Educational Work

Fedders Mfg. Co., Inc.  
Buffalo, N. Y.

Editor:

I have read with very much interest your article in the Nov. 16, 1938 issue, page 6 "Kind of Knowledge Needed to Engage in the Air-Conditioning Business."

I would appreciate it very much if you could send me a dozen tear sheets of this article to be used as educational matter, and oblige.

HARRY SCHMIDT,  
Air-Conditioning Engineer

### His Excuse of Being Busy Seems Legitimate!

Eureka, Kansas

Sirs:

About the only excuse that I can think of for not renewing my subscription last spring is that I am usually too busy in the summer months to keep up on my reading of it and just neglected it.

I have a general store and ice plant which I operate 14 hours a day. I also do some work for an oil company here, and also I am kept pretty busy doing refrigeration installation and service work.

However, in winter I have more time, and enclosed you will find my check for \$4.00 for another year of the News.

I have no criticism whatever to make of the News, I think it is by far the best paper for the trade that can be bought, and I hope you continue to render that valuable service to the cooling industry.

H. E. SPRIGGS



## THE COLD CANVASS

By B. T. Umor

(Concluded from Page 1, Column 1)  
In his private experimental laboratory (no connection with the Crosley Corp.) he has been making automobiles for a number of years. Also airplanes, motor scooters, and what-not.

But there has been no move to go into production. Those rumors you heard gained credence when Mr. Crosley asked for quotations from certain parts manufacturers. He simply wanted to know how much it would cost to produce one of those autos.

His curiosity satisfied, he now goes back to further experimenting.

### Improved Aroma

Some of B. T. Umor's old cronies in the refrigeration industry have long contended that a pipe was more befitting to the conductor of a column than those evil-smelling El Ropos to which he has been addicted.

Recently machinery has been set in motion over in Ohio to force the issue. Crosley's Vice President Charles D'Olive fixed Old B. T. U. up with a special non-tongue-burning blend of tobacco, and Lee Clark, Frigidaire sales promotion manager, provided the pipe.

The noticeable improvement in the aroma has been remarked upon by several, including veteran pipe smokers Harvey Lindsay of Dry-Zero and John Ditzell of Stewart-Warner.

"It's bad enough for your column to smell," some have pointed out.

### A New Drive To Stop Independent Operators

The Bureau of Internal Revenue has published three decisions regarding the payment of social security taxes on the remuneration of individuals engaged in the production of radio broadcasts. The three decisions are significant, says Printers' Ink, in that they indicate the thinking of the bureau.

"Very evidently, the bureau is intent that everyone possible shall be an employee of someone rather than an independent contractor."

There was a time, in past history, when every man was either a master or a slave, and when most of the population was in the latter classification. In these days, the masterless man has no rights under the law.

One of the great boons of our democratic government has been the ease with which any individual, who so desired, could go into business for himself. Anyone could become an independent contractor by simply making up his own mind to do so. He did not need to ask anybody's permission.

Even the individual who had no taste for the responsibilities of an independent business man and preferred to be an employee, had the greatest of freedom because he could quit his job whenever he saw fit to do so. Furthermore, he could take another job, at any sort of work he cared to tackle, with relative ease.

Trade union restrictions and the present trend of governmental regulations all tend to freeze the employee in his job and to freeze him out of a job entirely if he happens to get started in an industry, or a classification of employment, which does not prosper.

It is true that the modern industrial system has become tremendously complicated, making it more difficult for the individual to find his place in the scheme of things but, by the same token, B.T.U. believes that the said modern industrial system is entirely too complicated for any one individual, or any bureaucratic government, to manage.

No doubt individual initiative has been responsible for many mistakes; but it had the advantage that the individual could also correct his own mistakes.

If we have to suffer from mistakes, we would rather have the privilege of making our own mistakes and suffering for the same, rather than to be forced to suffer for mistakes made in Washington.

## January Exhibition To Present Broad View Of Industry Products

(Concluded from Page 1, Column 4)  
present to display their products at the show have contracted for more than 27,000 sq. ft. of space in the Exhibition Hall, largest in any hotel in America. Already eight more spaces have been sold than were originally plotted last May, when the contract for the hall was signed.

To handle this overflow, the hotel management has been required to release one of the two aisles reserved at that time for the storage of machinery to be shown in the Canners' Convention, the week following the All-Industry Exhibition.

"If orders continue the way they've been coming in during the past two weeks," Mr. Knight said, "the hotel will have to hunt up other storage space for Canners' Convention machinery. We'll need every foot of the hall."

### WIDE RANGE

Gratifying to the committee is the wide range of products that already are represented in the exhibition, particularly from the air conditioning, commercial refrigeration, beverage cooler, and similarly related branches of the industry.

Many of the exhibitors have not heretofore displayed their products at either a refrigeration or air-conditioning show, it was pointed out. These, with others who likewise have not been closely identified with the industry, are expected to round out the lines to be represented, and make the January show a truly all-industry event.

With the sale of space well in hand, the committee is turning its attention to attendance promotion work. Publicity campaign is under way, with 100,000 stationery labels going out on letters written by exhibitors, wholesalers, and jobbers. Large broadside and wall and window posters will be available shortly after Dec. 1, and attractive envelope stuffers will be used to blanket the trade before the holidays.

A heavy schedule of publicity bulletins also will tie into other mailings, and will continue until a week before convention time.

### PLAN MANY MEETINGS

Officers and committee members from the various organizations which will hold conventions and meetings during the show week also are at work on their individual programs.

Foremost among these are the mid-west sections of American Society of Refrigerating Engineers. With the Detroit, Milwaukee, and St. Louis sections cooperating, the Chicago section of the society is planning a full day's program on Jan. 17.

Forenoon will be spent at the exhibition, with an educational program in the afternoon, followed by a social hour and a dinner and meeting in the evening. Prominent members from eastern sections have been invited to address the meeting, in addition to a speaker from each of the participating sections.

The Illinois Association of Refrigeration Service Engineers is planning an all-day program on Jan. 16, details of which as yet are unannounced.

### BLYTHE CHAIRMAN

H. W. Blythe, Chicago jobber, has been named chairman of the program committee for the National Refrigeration Supply Jobbers' Association, which opens its fourth annual convention on Monday afternoon, Jan. 16, to run through the first three days of the week.

Several of the regional jobbers' associations also have planned meetings during the week, dates of which have not been set definitely. Refrigeration Supplies and Parts Manufacturers Association's annual convention, and organization meeting of Air Conditioning Dealers and Contractors also are scheduled to be held during the show week.

It is expected, however, that all organizations will plan their meetings as close to Jan. 16 as possible, so as to give their members an opportunity to attend the All-Industry Banquet to be given that evening under the auspices of the exhibition committee. H. W. Burritt, Kelvinator vice president in charge of sales, and L. R. Boulware, vice president and general manager of Carrier Corp., will be banquet speakers.

## Tests Show Insulation Stands Trial of Years

CHICAGO—Recently the Wood Conversion Co. set out to check definitely the performance of its insulation in refrigerators. The company asked the General Electric Co., one of the first companies to manufacture hermetically sealed boxes, to help locate the oldest G-E refrigerator of this type made, as Balsam-Wool was used in these first units.

In a Chicago apartment building, 36 were found still in operation. One of these 12-year-old refrigerators was sent to the Wood Conversion plant.

There, before members of the press, representatives of the General Electric Co., a member of the faculty of the University of Minnesota, and others, the cabinet was opened.

An emery wheel was used to cut through the metal at the top of the cabinet and down the edges. When the outside steel shell was pulled away, the Balsam-Wool still "nestled" snugly to the top of the box, and observers declared that no packing or settling had occurred.

Holes were then drilled in the lower part of the side wall to find, if possible, any evidence of condensation, mildew, rot, etc. The steel shell was pulled back, and T. Schantz Hanson, superintendent of the Minnesota State Forestry Experimental Station, pulled out a handful of Balsam-Wool and pronounced it as dry and clean as the day it was installed.

This refrigerator was torn down not only to confirm laboratory tests with actual "on the job" performance, but to show the practicability of hermetically sealed cabinets.

## Businessmen Seeking Wagner Act Change

AKRON, Ohio—Translating one of the resolutions it recently adopted at Pittsburgh into definite action, the National Small Business Men's Association has undertaken a nationwide drive for changes in the Wagner Labor Relations Act. The Association has invited every business, trade, and professional organization in the country to join forces with it.

A two-way move to impress Congress how American business, its employees, and customers feel about the Wagner Act is now being carried forward.

Petitions are being circulated among those business men and industrialists who collectively do most of the business done in America, who pay most of the taxes, who employ most of the workers, and who have more at stake than any other group. Thousands of signatures are expected as convincing proof to Congress that these people want changes made in the act.

The Association is sponsoring meetings of employers with their congressmen, at which first-hand information about the operation of the act as it stands is being given to the law-makers. In this way it is expected to arm the legislators with new data which they never before had, and which they can use as a guide when the measure comes before them next year.

The Association proposes to put the petitions into the hands of President Roosevelt, the National Labor Relations Board, and leaders of Congress.

## Servel Head Feted as 'Outstanding Citizen'

EVANSVILLE, Ind.—Louis Ruthenburg, president of Servel, Inc., has been selected as Evansville's "outstanding citizen of 1938" by the local Chamber of Commerce. At a testimonial dinner given by the organization's "12:06 Club" last week in Hotel Vendome, attended by 200 members and guests, he was presented with an engraved desk pen symbolizing the honor.

In presenting the award, Arthur P. Eberlin, manager of the organization, of which Mr. Ruthenburg is a vice president and director, said that the Servel president had been selected because of his service to the community in stabilizing employment in a normally seasonal industry, for introducing a safety program at the Servel plant, and for other similar praiseworthy acts.

The award is made annually to the citizen who is selected as deserving of recognition because of his participation in and contribution to the city's civic, social, and business life.

"Industry has a definite responsibility to the community," Mr. Ruthenburg said in accepting the award. "We at Servel have attempted to discharge that responsibility in the past, and we shall continue to try in the future."

"I feel a bit embarrassed about accepting this honor in my name," he went on. "I have a large organization of men behind me. All that Servel has done for the community must be credited to them. So it is in their name that I accept this honor."

Where Appearance Counts...

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PROTECTS FINE  
REFRIGERATOR  
FINISHES



THE fastidious house-keeper takes pride in a spotless kitchen. Being the most prominent and costly unit in the room, the refrigerator must retain that orig-

inal gleaming white to assure owner satisfaction. With Bonderizing as a part of the finishing system, the enamel is anchored to the metal and rust is defeated.

Finish permanence and efficient operation are twin qualities that count in making sales. Make sure the customer knows that the refrigerator you sell is Bonderized.

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A book showing what a salesman should know about Bonderizing is available on request.

**PARKER**  
Processes CONQUER RUST  
BONDERIZING • PARKERIZING



## How Air-Conditioning Dealer Differs From Heating Contractors Argued At Meeting

(Concluded from Page 1, Column 5)  
sold as an integral part of heating and piping contracts," Mr. Dickerson said. "Compressors and coils have much the same place in our scheme of things as fans, motors, and filters."

Mr. Dickerson was accompanied to the Detroit meeting by H. M. Hart of L. H. Prentice Co., also representing the Heating and Piping Contractors National Association, and Louis T. Braun of the Chicago Master Steamfitters' Association. L. L. McConachie, representing the Detroit Master Steamfitters' Association, also attended the meeting.

Outlining the position of the air-conditioning dealer, John H. Keller of Mechanical Heat & Cold, Inc., who presided at the meeting as president of the Air Conditioning Association of Michigan, asserted that:

### NEW TYPE OF DEALER

"A new type of organization has grown up in the air-conditioning industry during the past 15 years, which is more interested in the sale of air-conditioning equipment than in installation work."

"Our business," Mr. Keller stated, "is to create a market for air-conditioning by selling equipment. Installation work is incidental, for we sublet most of the work, with the possible exception of Freon piping."

"Because of the fact that we sublet the major portion of our installation work to recognized concerns in the heating and piping field, I see no reason for conflict between the two groups."

Mr. Dickerson pointed out that while there was no reason for conflict, that "everything that could be accomplished by any association of air-conditioning dealers could best be handled by the existing Heating, Piping, and Air Conditioning Contractors' National Association."

"I see no reason," Mr. Dickerson said, "for a duplication of effort or a rival organization. We have the machinery set-up to do anything that the air-conditioning dealers may want."

### DEALERS ARE 'SELLERS'

Speaking as a dealer representing the "closed franchise" type of account, H. C. LeVine, Atmospheric Control Corp., Carrier distributor, said, "we are interested in selling equipment, and make a practice of subletting most of our installation work."

"The heating and piping contractors have never 'sold' air-conditioning equipment. The burden of merchandising has been left to the air-conditioning dealer like myself. Now when the industry has reached a point where there is some valuable business on hand, the heating and piping contractor comes along and wants the business."

### NO NEED FOR RIVALRY

"I do not see where there is any need for rivalry between the two groups," Mr. LeVine continued, "but I do feel that the problems of sales, codes, bidding practice, and standards exist which are peculiar to the air-conditioning dealer."

H. M. Hart admitted that the heat-

ing and piping contractors had been lax in the sale of equipment, as their organization was primarily interested in installation work.

Mr. Dickerson asserted that from the viewpoint of the national heating and piping contractors' association, "sales efforts during the past should have been directed toward the architect and engineer, to assist the heating and piping contractor to create a market for air-cooling equipment."

"Our opinion is that in a few more years all air conditioning will be sold through the heating and piping trade," Mr. Dickerson said.

### BURDEN ON DEALER

Mr. LeVine retorted that "the architect as a class has never been inclined to accept any new development until it is in general use, and the burden of pioneering air conditioning has been on the manufacturer and his dealers."

"Under the scheme of things outlined by Mr. Dickerson, there is no place in the industry for the air-conditioning dealer. If the manufacturer sells equipment and the heating and piping contractor installs it, there is certainly no place in the picture for us."

C. E. Hansen of Smith & Oby Co., Cleveland, who are members of the Heating, Piping, and Air Conditioning Contractors' National Association, as well as members of the Air Conditioning Association of Cleveland, Inc., said:

"While we are intensely interested in the work of the heating and piping contractors' association, we know that in Cleveland only a few of this group are interested in the air-conditioning business in any way."

### CLEVELAND DEALER SPEAKS

"As franchised dealer for Carrier Corp. we have problems of sales and trade relations which are entirely separate from those confronting the heating and piping contractors."

"We feel that there should be harmony between the two groups at all times, as we are naturally interested in the welfare of both branches of our business."

M. A. Thesmacher, president of the Air Conditioning Association of Cleveland, described the organization and activities of that group.

"By working together in Cleveland the air-conditioning dealers have been able to arrive at industry standards to be used in the design and installation of equipment in the Cleveland area," he said.

"Certain members of the Air Conditioning Association of Cleveland are members of the Heating, Piping, and Air Conditioning Contractors' National Association," Mr. Thesmacher said. "But I see no reason for any conflict between the two groups."

### LOCAL CHAPTER GROWS

"We have certain problems which are handled entirely by the Air Conditioning Association of Cleveland, and our organization has met with a good deal of success."

"Perhaps it would be advisable for the various local air-conditioning dealers' associations, such as we have in Cleveland, to strengthen their organizations before steps are taken to set up a national association of air-conditioning dealers."

"The Cleveland group can be counted on to take an active part in discussing the entire situation further during the Chicago meeting in January."

Louis S. Morse, Jr. of Westerlin & Campbell Co., Detroit York distributor, said, "our firm is represented as a member of the Heating, Piping, and Air Conditioning Contractors' Association in Chicago, but

there are problems handled by the Air Conditioning Association of Michigan, of which we are also members, which are entirely apart from those handled by the heating and piping contractors."

### DIFFERENT PROBLEMS

"I believe," Mr. Morse said, "that further consideration should be given to a national group of air-conditioning dealers, as distinct from heating and piping contractors."

Mr. Keller stated that "the air-conditioning dealer is interested in engineering and sales, and I believe the industry would benefit from some means of exchanging information about these problems."

Mr. Keller asked Mr. Dickerson if it would be possible for firms of air-conditioning dealers, or entire local air-conditioning bureaus, councils, and associations, to become part of the national heating and piping contractors association without joining the local groups of that organization.

"Under our existing by-laws," Mr. Dickerson said, "that would be impossible, but perhaps something could be done to change the by-laws at our next annual meeting, which will be held in Chicago in May."

### OFFICERS ASK HEARING

"We would like to have the air-conditioning dealers here submit to our national council of the Heating, Piping, and Air Conditioning Contractors' National Association, a list of the problems confronting the air-conditioning dealer today, to see if they might well be handled by our association."

Mr. Keller pointed out that if air-conditioning dealers became members of local divisions of the Heating, Piping, and Air Conditioning Contractors' National Association, the air-conditioning dealers would be out-voted in almost every case and have no real voice in the affairs of the association.

### MORE IN CHICAGO

L. L. McConachie of the Master Steamfitters Association of Detroit stated that the Heating, Piping, and Air Conditioning Contractors have 14 member firms in Detroit. Mr. Keller reported that the Air Conditioning Association of Michigan now has 10 member firms, including three factory operated branches of major manufacturers.

R. L. Spitzley of R. L. Spitzley Co., Detroit, whose organization has been associated with both organizations in Detroit, attended the meeting.

Others in attendance were S. S. Sanford of the Detroit Edison Co. and F. M. Cockrell, publisher of AIR CONDITIONING & REFRIGERATION NEWS.

The group voted to continue the discussion at the Stevens hotel, Jan. 17, and that the Air Conditioning Association of Michigan, 5231 Cass Ave., Detroit, should be used as a "clearing house" for an exchange of information and ideas relative to the proposed national air-conditioning dealers association until the Chicago meeting.

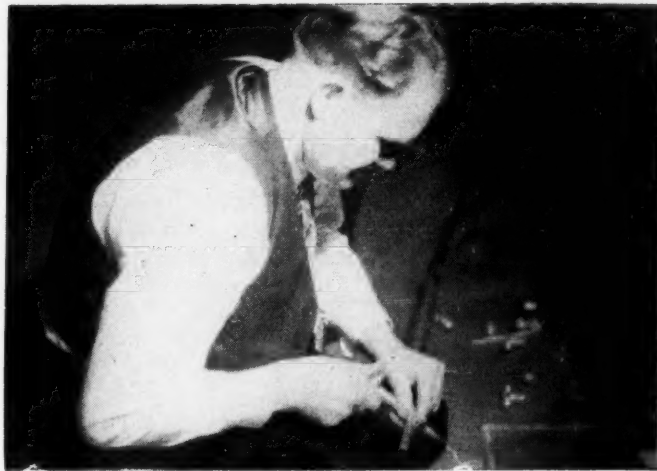
### Chicago ASRE To Hear Talks on Controls, Coils

CHICAGO—Controls and coils will be the principal subjects of discussion at the dinner meeting of the Chicago section of American Society of Refrigerating Engineers, to be held at 6:30 p.m., Dec. 1, in the Drake hotel.

Harry A. Phillips, member of the Chicago section and president of H. A. Phillips & Co., will discuss "Controls for Flooded Operation of Freon Evaporators" in the first half of the evening's program. His talk will be illustrated with slides.

Second speaker, M. W. Knight, sales manager of Peerless of America, Inc., will show moving pictures describing the latest development in the manufacture of Peerless cooling coils for refrigeration and air conditioning.

## This Is Hubert Spencer of Nashville, Tenn.



In the caption under this picture which appeared on page 4 of the Nov. 9 issue of AIR CONDITIONING & REFRIGERATION NEWS, a full page of pictures on the tube bending contest sponsored by the Imperial Brass Co. at the recent refrigeration service engineers convention in Buffalo, the editors said "we think this contestant is Don Matheson of Washington, D. C."

It turned out that the editors' "thinking" was wrong, however, for the man really is Hubert Spencer, refrigeration service engineer of Nashville, Tenn. Because the error not only disappointed Mr. Spencer, but also the Nashville chapter of the Service Engineers Society whom he was representing, we are running this photograph again.

## Past Flood Work Proves Valuable In G-E's Service Work In New England Area

CLEVELAND—Cashing in on the experience gained from its work in the flood areas of Harrisburg, Pa. in 1936 and in the Pittsburgh and Ohio Valley areas in 1937, the Product Service Section of General Electric Co. was able to carry on an efficient rehabilitation program in hurricane-stricken New England recently.

R. C. Cady, Product Service representative for the company in the Boston area, was in general charge of emergency operations. Through his efforts, radio broadcasts were arranged for the purpose of advising refrigerator owners what sanitary measures and precautions should be employed before refrigerators could be re-used.

### 'FLOOD REQUISITIONS'

In addition, Mr. Cady contacted distributors and dealers in the hurricane area, to determine the extent of damage done, and what materials would be needed. Through arrangements with the Cleveland office, these "flood requisitions" were given emergency handling, being sent into the stricken areas by air express, bus, and train.

Also active in the hurricane area were J. F. Welch and J. C. Bennewitz, sent in for emergency duty by W. C. Noll, manager of the Product Service Section. Mr. Welch went to Providence, R. I. and Mr. Bennewitz to Hartford, Conn. Later, Mr. Noll himself went into the area to inspect the progress made.

Many unusual means were resorted to in getting into the hurricane area. One member of the Product Service Section was week-ending in Fort Wayne, Ind. when Mr. Noll's emergency call to emergency duty arrived. For the trip, both money and clothes were required. Through the assistance of Chester Lichtenberg of General Electric's Fort Wayne office, it was possible to get both—and this on a Sunday.

### THEY GET THROUGH

Both Mr. Welch and Mr. Bennewitz had difficulty in arriving at their respective destinations. Mr. Bennewitz got as far as Albany, N. Y. by train, and had to take a bus from there to Hartford. Mr. Welch managed to get as far as Newark, N. J. by train, and was lucky enough to get a plane reservation, which some one else had cancelled, from there to Providence.

Hotel accommodations actually seemed primitive when a Product Service man was confronted by the necessity of signing the register by candle-light, carrying a lighted candle

himself, and walking up six flights to his hotel room.

Assisted by E. Pulver Cook, Inc., G-E distributor in Providence, the Product Service Section set up a service shop for reconditioning ranges and refrigerators. Within 10 days this service was made available to dealers in communities surrounding Providence. Within three weeks' time, dealer and distributor stocks were cleaned up.

Shop operations will be continued by the Cook organization for the next six months, however, in an effort to get all customers' appliances cleaned up and repaired.

Success of the reconditioning work was made possible only by the co-operation of factories, stock rooms, and all other affiliated departments in arranging for prompt shipment of needed materials, it is pointed out.

In this emergency, as in the case of previous floods, General Electric flatplate ironers came in for their share of attention and use. The ironers are used in reclaiming valuable papers which have become water soaked. Each piece of paper must be handled separately. After water and mud have been wiped off the paper, a blotter is applied. Finally the paper is pressed dry in an electric ironer.

### DEALERS' EXPERIENCE

Experience of some General Electric dealers in the Connecticut area were described by Miss Margaret McCarthy in a recent issue of the "Orkville News," publication of Orkville Electric Co., G-E distributor in Hartford.

"Hendel Furniture Co., General Electric dealer, already has established itself again, and is now waiting to crack the whip for holiday business," Miss McCarthy reports.

"Norwich, located 20 miles from the shore, actually was flooded by the tidal wave. Twelve feet of water were laid on the business section . . . and after it subsided a dirty mud about 2 inches thick covered everything . . . Hanover-Curland Co., General Electric dealer, however, is all ready to open its new store, showing the enterprise of two good business men."

"Spicer Ice & Coal Co., New London, found that hooking up a range for cooking demonstrations really paid for itself. They used it for baking out motors."

### Smith & Lerch Will Manage Jackson's Service Dept.

SAN JOSE, Calif.—Bryon Smith and Maurice Lerch have been named co-managers of the repair and service department of Merlin Jackson Co., 118 S. Second St.

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## Commercial Service

### Service Complaints & Instructions For 'Two Boiler' Soda Fountains (Cont.)

The following is a continuation of the information on the servicing of the "two-boiler" soda fountain, first part of which was published in the Nov. 23 issue of AIR CONDITIONING & REFRIGERATION NEWS.

The article is part of a series of the servicing of soda fountains, ice cream cabinets, and counter-type ice cream freezers, written by Mr. Black and Mr. Seitz, which began with the Oct. 19 issue.

By Arch Black and Dean C. Seitz

#### 6. FROZEN BRINE

Frozen brine can most easily be recognized by tapping the bottom of the brine tank with a long stick such as a yard stick. If the brine is frozen or slushy a dull thud will be heard as the stick is tapped on the bottom of the tank.

The remedy is to pull the switch, allow the frozen brine to melt and syphon it out of the brine tank. While this operation is being performed the user should be advised to place dry ice in the ice cream sleeves to prevent the ice cream from getting any softer. If it was already too soft for use, the user should advise the ice cream company so that a fresh delivery can be made promptly.

After removing the brine from the tank, it should be replaced with brine of the proper density. Never endeavor to strengthen the density of the frozen brine inside the brine tank. (See previous article on brine.)

#### 7. BRINE LEVEL TOO LOW

Remedy—If the brine level is too low, ice cream at the top of the can will be soft and at the bottom it will be hard. The correction is to mix up sufficient new brine of the proper density to fill the brine tank properly. Never add water to the brine in the tank in order to raise its level. Check tank for leaks before leaving.

#### 8. SHORTAGE OF REFRIGERANT

Remedy—Shortage of refrigerant in a two-boiler soda fountain can usually be determined by the hissing noise at the float valve (an exception to this rule will be given in a later article). The hissing is usually accompanied by low head pressure, warm liquid line, and continuous operation in extreme cases. A leaky float valve likewise produces a hissing noise; however it is accompanied by a frost back.

The proper remedy for shortage is to add refrigerant until the hissing ceases and the proper head pressure is obtained. If a refrigerant sight glass is installed in the liquid line, additional refrigerant may be added until the flashing no longer occurs in the glass.

#### 9. CREAMER UNIT LIDS REMOVED WITH CEILING FAN IN OPERATION

Remedy—It sometimes occurs that a soda fountain operator removes the lids from the ice cream section of his creamer unit during a rush period. If a ceiling fan operates directly above the creamer unit, the movement of warm air will soften the top of the ice cream. The easiest remedy is to call the customer's attention to this condition, asking him to either turn off the fan or keep the lids closed.

#### 10. HIGH PRESSURE CUT-OUT

Remedy—If the high pressure cut-out has broken the switch contact, the cause of the high pressure should be determined and corrected before leaving the installation.

If purging corrects the high pressure, the possible leak which permitted the air to enter the system should be found. Also check the ventilation on an air-cooled refrigerating machine and the inlet water

temperature on a water-cooled refrigerating machine.

#### 11. BELT BROKEN

Remedy—If the belt is broken or off the flywheel, replace or install a new belt and adjust the motor for the proper belt tension. Check the pulley alignment before leaving.

#### 12. LEAKY DISCHARGE VALVE

Remedy—A leaky discharge valve produces a long running cycle but

difficult diagnosis to make. It is usually caused by the use of a too heavy oil, which may have been added on a previous service call or by the accumulation of too much oil in the boiler caused by wrong location of oil return hole in suction tube.

Either too heavy an oil or too high a level of the proper oil will form a blanket over the refrigerant of an SO<sub>2</sub> boiler. This blanket will make it very difficult for the evaporated gas to pass through the oil layer. A low vacuum on the top of the oil will be necessary to permit any bubbles to burst through the blanket.

Fig. 1 shows a typical float valve assembly. If the suction tube has been bent upward the oil overflow hole will be moved too high. This will increase the blanket of oil over the refrigerant, making it difficult for the refrigerant gas to pass through the oil blanket.

When this condition occurs, the refrigerating machine will run at extremely low suction pressure without producing much refrigeration. At irregular intervals a loud rumbling noise such as an explosion will be heard inside the boiler. When this occurs, some of the gas bubbles have burst through the oil layer due to the difference in pressure between the gas on top of the oil and the refrigerant below the oil.

By watching a suction gauge installed on the suction side, it will be seen that these explosions cause a rapid and sudden increase in suction pressure. Shortly after the explosion

### Details of Float Valve Assembly

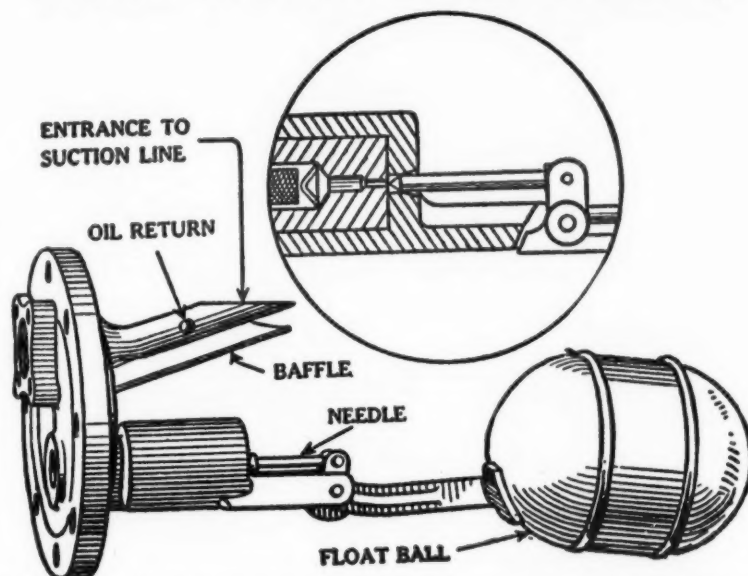


Fig. 1—A typical float valve assembly. If suction tube has been bent upwards, the oil overflow hole will be moved too high.

will not cause the condensing unit to short cycle. It may cause continuous running if the leak is very bad. It is usually accompanied by low head pressure and poor refrigeration which is the cause of the ice cream becoming soft.

The remedy is to replace the discharge valve or the discharge valve plate assembly. Always use new gaskets and make certain that the thickness of the new gasket is the same as the old gasket.

#### 13. PLUGGED LIQUID LINE STRAINER

Remedy—A plugged liquid line strainer will produce the same symptoms as a stuck-shut float valve. The difference lies in the fact that the liquid line leading from the strainer to the boiler will be cool. The remedy is to replace the strainer with a new one.

#### 14. VALVES NOT OPEN

Remedy—In order that the service engineer may never be fooled on this point, it is always good policy to check all the valves on the system when the initial inspection is made. Remember that there are two valves on each boiler.

#### 15. OIL-BOUND BOILER

An oil-bound boiler is the most

takes place, the suction pressure will again go to a very low point, and practically no refrigeration be produced.

This condition is known as an oil-bound boiler. The most satisfactory remedy is to remove the entire boiler from the brine tank and discharge it of both refrigerant and oil. Then replace either with an entire new boiler containing a new float valve (or a new float valve only) and the proper charge of refrigerant and oil.

If there is any question as to the type of oil in the entire system, it is advisable to discharge the refrigerating machine of its refrigerant and oil at the same time so that the entire system may be recharged with both refrigerant and proper oil.

It is never advisable to bend the oil overflow tube downward in an attempt to reduce the oil level. This bending will most likely result in frost back which will later require a complete change of the float valve.

Summarizing the above, the most

satisfactory remedy is to discharge the entire system, replacing either the entire boiler or only the float valve.

#### (b) ICE CREAM TOO HARD

The second complaint which may be received by the service engineer is that the ice cream is too hard. Before taking for granted that the difficulty lies in the refrigeration installation, check the brine temperature.

If the brine temperature is not below —5° F. on a full-depth brine tank or —8° on a stub brine tank at a point one-third up from the bottom of the tank, then check with the customer as to the condition of the ice cream when it was delivered. It is possible that the ice cream was exceptionally hard when delivered from the ice cream company, in which case several hours must elapse before it will equalize with the temperature of the air in the ice cream storage compartment of the creamer unit.

#### 1. CUT-OUT POINT TOO LOW

Remedy—If the brine temperature is too low, it is most likely caused by a too low cut-out point of the low-pressure switch. Raise the cut-out point approximately 1 inch (1/2 lb.) at a time.

#### 2. CUT-IN POINT TOO LOW

Remedy—If the cut-in point is too low, the condensing unit will short cycle. The short cycle will maintain the brine at the bottom of the cycle, producing too cold an average brine temperature. The remedy is to set the cut-in temperature at such a point that the idle cycle will be approximately one-half hour.

### Detroit Survey Indicates Big Potential Market

DETROIT — Purchase of 15,736 electric refrigerators is contemplated by Detroit families in the period between Nov. 1, 1938 and Jan. 15, 1939, it was revealed in a survey of consumer buying preference made for the Detroit Crusade for Jobs.

The survey, based on a one-in-five sampling of 350,000 families in Detroit, shows that families studied are considering the purchase of 87,351 home appliances.

### Infringement of Patent On Pre-Cooling Found

LITTLE ROCK, Ark.—A finding that the Pre-Cooling Car Service Co., Minneapolis, had infringed upon a patent issued Vance M. Thompson, of McCrory, Ark., in manufacturing and selling pre-cooling apparatus, machines, and devices was made by Federal Judge Trimble here. Thompson was granted an injunction restraining the company from further manufacture or sale of such products.

Damages totaling \$3,202 were awarded Thompson against H. Rouw Co., garnishee, and the court appointed Charles S. Harley as special master to make an accounting of damages, if any, that the Pre-Cooling Car Service Co. owes Thompson.

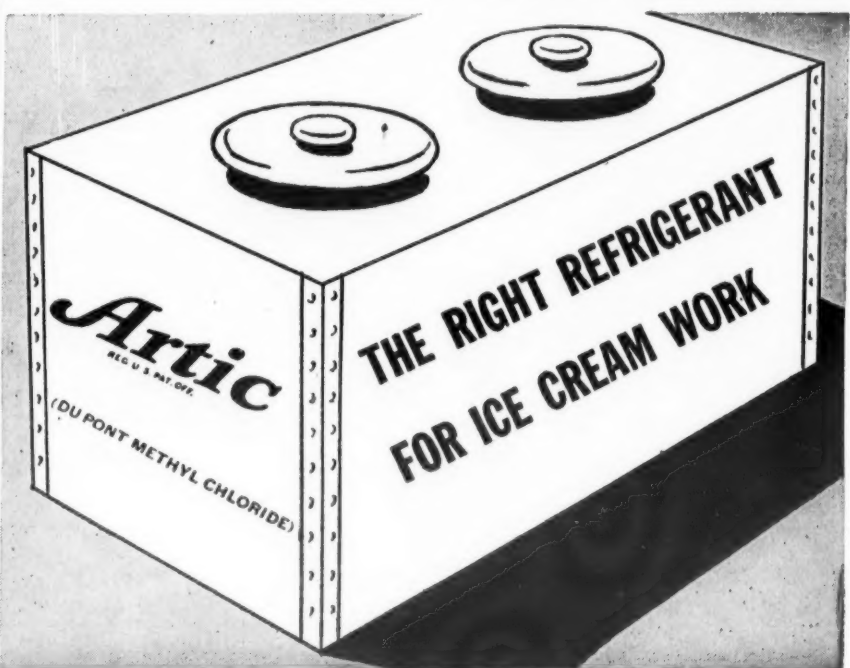
Of the amount awarded Thompson against the garnishee, all but \$1,980 has been released by court order. The H. Rouw Co. is engaged in business in Van Buren and Judsonia in handling strawberries and other fruits for growers. It has been employing the Pre-Cooling Car Service Co. to pre-cool refrigerator and express cars for servicing fruit for shipment to points of distribution.

### Diesel-Driven Compressor Introduced By Ingersoll

PHILLIPSBURG, N. J.—A new heavy-duty, Diesel-engine-driven compressor, known as the "XVO," has recently been announced by Ingersoll-Rand Co. here for use in ice and cold storage plants, mines and quarries, construction and contracting, and general industrial service.

The machine is suitable for use in independent or isolated compressor plants, or when existing power facilities are overloaded, it is claimed. Said to be entirely new in design, it combines a horizontal heavy-duty double-acting compressor with a heavy-duty "V" type four-cylinder Diesel engine in a single compact unit operating at moderate speed.

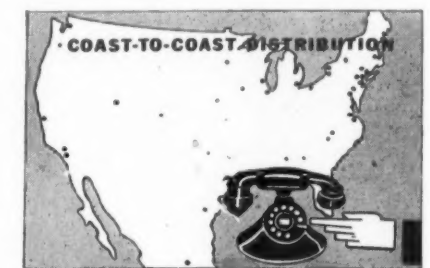
Sizes are available for actual-free air delivery ratings of 625, 935, and 1,250 c.f.m. of 100 lbs. sea-level compression. In addition, a wide variety of air, gas, and ammonia compressing cylinders is available.



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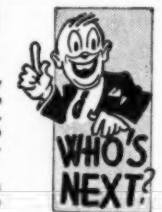


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# Commercial Refrigeration

## Types of Commercial System Controls and How They Work Under Various Conditions

*Editor's Note:* This is the second part of an article by A. B. Newton in which he discusses the function of controls in a commercial refrigeration system.

In this instalment he describes the various types of control systems which have been and are being used, how they function, and the characteristics and limitations of each type. He also explains what they mean in terms of proper preservation of foodstuffs.

First part of this article on commercial controls was published in the Nov. 23 issue.

By A. B. Newton, Engineering Dept., Minneapolis-Honeywell Regulator Co.

### Types of Refrigeration Control

Table 2 lists the five most common types of refrigeration control, and shows the results obtained with them for normal load conditions, light load conditions, and heavy load conditions.

On practically every commercial refrigeration installation the design condition, or normal load condition, represents the load on the box in the summer time with normal service.

Loads lighter than this are experienced during week ends and inactive days during any season, and during intermediate seasons and the winter season.

Loads heavier than this are experienced during rush hours, during periods of stocking up the box, or during periods when the box temperature is being reduced either for

the purpose of carrying a lower temperature, or after periods when the refrigeration system has not been in operation.

Thus the so-called "normal load condition" usually exists only a very small percentage of the time, and the commercial refrigeration system is usually operating under light load or heavy load conditions. Table 2, therefore, shows the reaction of the various control systems as load conditions depart from the normal, and the degree to which the conditions mentioned are reached depend to a large extent on the amount of departure of the load from normal conditions.

It should also be noted that an installation of the "borderline type," in which the coil and compressor are sized too small, will in effect operate

Table 2—Response of Typical Control Systems Under Varying Loads

	LIGHT LOAD	NORMAL LOAD	HEAVY LOAD
<b>1. Pressure Control</b>			
Temperature	Dangerously low. Wide fluctuation.	Normal.	Dangerously high.
Relative Humidity	Too low. Wide fluctuation.	Normal.	Wide fluctuation.
Frost	Defrosts each cycle.	Defrosts each cycle.	Defrosts each cycle.
<b>2. Temperature Control</b>			
Temperature	Normal. But infrequent operation at usual differential.	Normal.	High to excessively high.
Relative Humidity	Wide fluctuation, going too high.	Normal.	Wide fluctuation.
Frost	Some danger.	Some danger.	Serious frost.
<b>3. Pressure Control in Series with Temperature Control</b>			
Temperature	Normal. But infrequent operation at usual differential.	Normal except during defrosting, then high.	High to excessively high.
Relative Humidity	Wide fluctuation, going too high.	Normal except during defrosting, then high.	Wide fluctuation.
Frost	Some danger.	Periodic defrosting, not each cycle.	Serious although may defrost each cycle at extreme load.
<b>4. Pressure Control in Parallel with Temperature Control</b>			
Temperature	Dangerously low. Wide fluctuation.	Normal.	High to excessively high.
Relative Humidity	Too low. Wide fluctuation.	Normal.	Wide fluctuation.
Frost	Some danger.	Some danger.	Serious frost.
<b>5. Pressure Control in Series with Temperature Recycling Control</b>			
Temperature	Normal. Frequent short operations at low differential.	Normal.	Normal to slightly high.
Relative Humidity	Normal or slightly high.	Normal.	Normal to some fluctuation.
Frost	Defrosts each cycle.	Defrosts each cycle.	Defrosts each cycle.

under heavy load conditions most of the time. Conversely, a system with more than adequate coil and compressor, though not common, will be operating in effect under light load conditions most of the time.

Referring now to Table 2, each of the control systems mentioned will be briefly discussed.

### 1—Pressure Control

By pressure control is meant any system of control by which the compressor is started and stopped substantially in response to the pressure in the low side of the refrigeration system.

The usual pressure switch when used alone in this category, as do temperature controls of the remote bulb type when used with their bulbs strapped to a portion of the evaporator.

Pressure control may be said to have one outstanding advantage, namely, that when properly set it accomplishes defrosting of the coil on each cycle.

It also has one outstanding disadvantage, namely, that it does not adequately sense the temperature condition in the refrigerated fixture.

True, a low temperature in the fixture will normally cause a slight reduction in the suction pressure during the operating cycle, while an increase in the fixture temperature will cause a slight increase in the suction pressure during the operating cycle.

As a result the ratio of operating to "off" periods is slightly reduced during the light load periods, and slightly increased during the heavy load periods. However, this change in operating time is not nearly sufficient to cause pressure controls to maintain uniform temperature.

Turning to Table 2, let us examine briefly the causes for the response indicated. Under the light load column it will be noted that the temperature variation expected with pressure control systems is too wide to give the desired temperature results. The compressor will be operated for longer periods of time, and for a greater percentage of the total time than is required to give the desired temperature, and as a result the temperature will fall, often to such dangerously low values as to cause freezing of some of the produce.

Furthermore, the long operating periods will be followed by longer off periods than normal, since the low temperatures will not melt the frost from the evaporator rapidly. It will often be found that moisture is deposited on the meat surfaces which then sweat during the off period, or produce may periodically freeze and then be warmed. The same condition causes undesirably wide fluctuations in the relative humidity of the fixtures.

Under heavy load conditions the fluctuation in temperature is likely to be even wider than at light load conditions, and the temperature will rise undesirably high.

There is nothing that can be done to eliminate temperature changes due to rapid load changes when using pressure control. However, the control may be readjusted to take care of long time trends in load change, as between summer and winter.

In so doing it is important to maintain the cut-in pressure high enough so that the coils will defrost on each cycle of operation, and thus, the readjustment should be made by one experienced in refrigeration work, and not by the user himself.

### 2—Temperature Control

By temperature control is meant the direct control of the compressor from a thermostat or temperature controller, located in one of the fixtures to be cooled. On small machines such an arrangement is often used without a pressure controller.

Referring to Table 2, it will be seen that danger of frosting exists under either light or normal load conditions, while at heavy loads serious frosting is almost a certainty, since the temperature control does not sense the evaporator condition.

If continued operation under temperature control is secured after frosting starts, the evaporator capacity is gradually lost as frost accumulates on it, thus causing a more rapid frost formation until the entire coil may frost solidly.

This is a serious situation and usually the ice must be chipped off, or melted off with a blow torch or warm water, in order to restore the system to operation in a reasonable length of time.

The temperature fluctuation when the coil is not seriously frosted is determined by the differential of the temperature control. The differential must be wide enough so that under average load conditions the coil will have time to defrost during the off cycle.

However, at light loads such an adjustment results in infrequent operation, with a resultant wide fluctuation in relative humidity.

This can be corrected by making a differential adjustment on the temperature control where a long time trend in load is concerned, as between summer and winter, but such an adjustment is not practical over short time load periods, such as occur over a week end or holiday.

With temperature control there is always a danger that the evaporator may frost almost solidly, as described above, under heavy load conditions; and even at normal or light load conditions, if frosting once gets started, due to a short heavy load, it is likely to continue and frost the evaporator very seriously.

Accumulation of frost causes loss of evaporator capacity and therefore the ability to cool the box is lessened, and the temperature in the box begins to rise. The thermostat continues to call for cooling, and to operate the compressor, resulting in more frost formation and greater sacrifice of the cooling ability of the coils.

As a result of this the temperature in the fixture will rise indefinitely, the total cooling being equivalent only to that possible with a block of ice the size of the coil.

Thus, it will be seen that the only possible advantage of temperature control over pressure control is that at light loads the temperature will not reduce to a dangerous amount and freeze produce, but temperature control has the very serious disadvantage that it does not sense the frost condition of the evaporator.

### 3—Combined Pressure and Temperature Control

(With the pressure switch connected in series with the thermostat.)

In an effort to combine some of the advantages of pressure and temperature control many installations employ a pressure switch connected in series electrically with a temperature controller so that both the pressure control and the temperature control must close their switch

contacts in order for the compressor to operate.

By referring to Table 2, it will be seen that at light loads the operation is similar to the operation with a temperature control, since the machine will cool the box rapidly enough for the thermostat to stop it before the suction pressure is low enough to operate the pressure switch.

It should be understood that the pressure controls of conventional design do not operate until the pressure is low enough to actually cause the switch contacts to open; thus the compressor may be started or stopped by the thermostat an indefinite number of times at any suction pressure above the cut-out pressure setting.

We have the same attendant danger under this condition that we had with temperature control of starting frost formation on the coil, and having it build up to a serious value.

If frost starts either at high load or light conditions it will eventually insulate the coils sufficiently, so that the suction pressure will be reduced and the pressure control rather than the temperature controller will finally stop the machine. With most finned coils it is possible to build up a considerable thickness of frost before the suction pressure is reduced sufficiently to open the contacts of the pressure switch.

With a heavy frost formation considerable time is required to melt the frost, and as a result the temperature rises excessively during the defrosting period. Thus, under this condition the combined temperature and pressure control is inferior to the usual pressure control.

Under exceedingly heavy loads, when the capacity of the refrigerating equipment is not sufficient to maintain the box temperature, the thermostat contacts will be continuously closed, and the machine will operate from pressure control. Under operation such as this the equipment will defrost the evaporator on each operating cycle.

### 4—Pressure and Temperature Control

(With pressure switch connected electrically in parallel with the thermostat.)

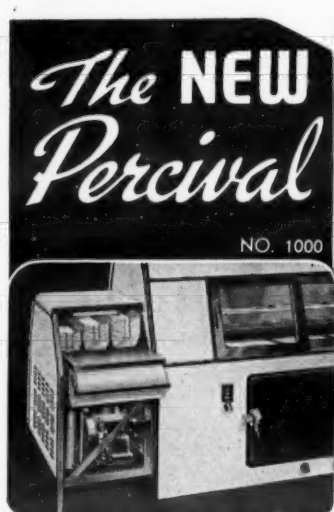
It is sometimes necessary to locate the compressor where it becomes colder than the fixtures, and when pressure control is used with a system in which the compressor is so located, the suction pressure may not rise sufficiently during off periods to cut-in the compressor. One method of overcoming this disadvantage of pressure control is to operate with a temperature controller connected in parallel with it.

Referring to Table 2, it will be seen that at light load conditions we have the same operation as with pressure control, with one exception. There is some danger of frosting, since a short heavy load as might be caused by placing new produce in the box may cause the thermostat to call for operation and frost the coil. The same danger exists at normal load conditions.

Under heavy load conditions, particularly when the load is heavy enough so that the temperature cannot be readily reduced by the refrigeration equipment, the machine may be continuously operated for a long period of time, and cause the evaporator to frost solidly, as with plain temperature control.

(Concluded on Page 13, Column 1)

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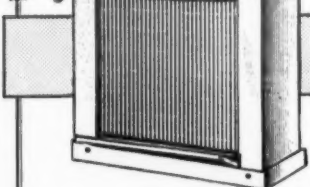
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## Purpose of New Recycling Type Controls and Instructions For Their Application

(Concluded from Page 12, Column 5)

Since the pressure control is connected electrically in parallel with the temperature control, it cannot stop the compressor under these conditions, and it will run until it is manually shut down and the coil defrosted by some artificial means.

### 5—Pressure Switch In Series With Thermostat, But of The Recycling Type

For safety reasons heating controls have long used the recycling principle, which requires that whenever any one of a number of factors stop the heating equipment, a large number of factors must reach their proper values before the equipment can again be started.

For example, when the burner has been operating for a long enough period of time to satisfy the thermostat, it shuts off the burner. When it is very cold outside, the thermostat may shortly try again to operate the burner, but the safety controls will prevent it until the temperature of the firing chamber is sufficiently low to make it safe to again ignite the burner. This principle of recycling has just recently been introduced into the refrigeration field.

The recycling control system consists of a low pressure control in complete charge of the compressor operation, which may also incorporate high pressure protection. As furnished by the company with which I am connected, this pressure control is electrically connected with a thermostat which acts to control the opening and closing of the pressure switch load contacts.

Since the thermostat stops the compressor by opening the pressure control contacts, the suction pressure must rise high enough to defrost the coil on every cycle before either the thermostat or the pressure controller can again start the compressor.

With this arrangement a very narrow differential thermostat may be employed, since when it breaks its contact at the end of an operating period and the compressor stops, the temperature rise may immediately close the thermostat contacts again, but no operation will be secured until the coil has defrosted. This works to eliminate short cycling.

The result is that the system operates as though it were connected to a thermostat which automatically adjusts the differential to the minimum value which will secure proper defrosting of the coil.

The recycling control system also stops the compressor upon a low suction pressure condition regardless of the box temperature, and after the compressor has been stopped by a low pressure condition the coils must defrost before the compressor is again allowed to start.

Without this provision the recycling control would be subject to the same frosting troubles as temperature control, whenever a heavy load occurs.

Referring to Table 2, let us examine the results produced with this type of control. Referring to the light load conditions, the small differential employed in the thermostat will operate the compressor for only a short period of time before it succeeds in lowering the temperature of the box to the thermostat setting.

As soon as the thermostat is satisfied, it opens its contacts, and causes the pressure control contacts to open and stop the compressor. Thus, in a sense, the thermostat controls the pressure control, which in turn controls the compressor.

The small differential of the thermostat makes it possible to call for another operation after a short interval of time, so that frequent short operation is obtained with very small temperature fluctuations, and yet the system will be free of the "short cycling" action, since short cycling is prevented by the pressure control.

This prevents excessive rise in relative humidity during the off periods and thereby minimizes the formation of slime and mold on produce, which is one of the serious difficulties encountered during winter operation with some control systems.

Furthermore, no frost can form on the coils and build up to excessive thickness, since at each cycle

the coils must be defrosted before the compressor can be started.

When the normal loads exist the pressure control contacts are opened by action of the thermostat, as soon as the temperature setting of the thermostat is reached. If a narrow differential thermostat is used, as it should be to obtain the greatest advantage from the cycling type of control, the thermostat will again close its contacts before the system has defrosted, thus enabling the pressure control to call for a compressor operation as soon as defrosting is completed.

Under these conditions the actual temperature differential obtained will be greater than the thermostat differential, but it will be the minimum which will produce satisfactory defrosting of the evaporator and maintain its capacity.

As the load increases toward the heavy load condition, normal temperature is maintained by this same action, and since the coil is kept free from frost, its capacity for cooling is maintained.

Because there is no danger of freezing produce at light load conditions, the cut-out setting of the low pressure control can be made several pounds lower than otherwise, and hence a heavier load can be carried without losing control of the temperature in the fixture.

At extremely heavy loads, beyond the capacity of the refrigerating system itself, the temperature may rise slightly, so that the thermostat will call for cooling all the time. Under these conditions the system reverts to pressure control with a little lower than normal cut-out pressure.

As the load reduces, temperature control is automatically resumed, and under all conditions defrosting occurs on each operating cycle.

### Cold Compressor Application Of Recycling Control

As mentioned previously, it is sometimes necessary to locate the compressor where the ambient temperature will be below that corresponding to the cut-in pressure. As a result, the cut-in pressure is not reached, since the compressor location rather than that of the evaporator governs the pressure in the system.

With recycling controls, the standard system as outlined can be employed, with the addition of a small timer, which periodically automatically shorts out the low pressure contacts of the pressure control for a short time interval.

At this time the compressor will be started and operated for some minimum time, such as one minute out of each hour. If sufficient head pressure exists to cause circulation of the refrigerant, the evaporation of refrigerant in the evaporator will raise the suction pressure, so that when the timer again opens its contacts, at the end of, say, a one-minute interval, the compressor will be held in operation through the action of the pressure control and thermostat.

It often happens under these circumstances that operation of the compressor raises the ambient temperature around it to such an extent that after a few operations by means of a timer, normal control is resumed.

If, on the other hand, the head pressure of the system is so low that liquid refrigerant can not be circulated, then it is impossible to build up the head pressure through operation of the compressor, and the suction pressure will be reduced to such a value that at the end of the interval established by the timer, the refrigeration system will again be stopped. Thus, waste of power at a time when the refrigeration system is incapable of producing refrigeration is prevented by action of the control.

Normally, the timer can be left in operation throughout the entire season, but if it is desired to cut out its action in the summer time on a deluxe job, a thermostat located near the compressor and set at some temperature, such as 40°, which is well above the cut-in pressure setting of the pressure control, may be used to cut out the action of the timer during periods when the temperature around the compressor is above the desired value. In this manner the timer is entirely out of the control system during the summer time.

## CLASSIFIED ADVERTISING

RATES: Fifty words or less in 6-point light-face type only, one insertion, \$2.00, additional words four cents each. Three consecutive insertions \$5.00, additional words ten cents each.

PAYMENT in advance is required for advertising in this column.

REPLIES to advertisements with Box No. should be addressed to Air Conditioning & Refrigeration News, 5229 Cass Ave., Detroit, Mich.

### POSITIONS AVAILABLE

ENGINEER: Commercial refrigeration application engineer for sales department. Must be thoroughly familiar with automatic control equipment and its use on commercial refrigeration and air conditioning equipment. Excellent opportunity with manufacturer of control equipment. Box 1091, Air Conditioning & Refrigeration News.

### REPRESENTATIVES WANTED

CANADIAN SALES Representatives: Pioneer United States manufacturer desires high grade representative for household refrigerators, also separate representation for commercial units. Commission basis with good income and exceptional future possibilities. Give full particulars, experience, etc., first letter. Box 1092, Air Conditioning & Refrigeration News.

WANTED: An aggressive sales representative with specialty appliance distributor and dealer contacts to handle a popular line of oil burning circulating space heaters and automatic kerosene burning water heaters manufactured by a reputable organization that has helped pioneer this market with national distribution now contemplating expanding line with complete line of ventilating equipment and modified air conditioning. For further information write Box 1093, Air Conditioning & Refrigeration News.

### POSITIONS WANTED

FIELD ENGINEER, service manager or service man—13 years of experience on all types and makes of commercial equipment. Experience on layout and installation of all applications from display cases to packing houses and ice cream plants. Solid educational background, married, willing to travel. Box 1082, Air Conditioning & Refrigeration News.

FACTORY REPRESENTATIVE, engineering graduate, 14 years' successful experience in oil burners and refrigeration, seeks connection with a reliable manufacturer. Thoroughly familiar with New England and Middle Atlantic territory. Commission basis possibly acceptable. Box 1085, Air Conditioning & Refrigeration News.

YOUNG, CAPABLE business woman, above average—Initiative, resourceful, adaptable—accustomed to responsibility, meeting public. Experience: past eleven years sales department—dealer and consumer distribution, large refrigeration and major appliance corporation—sales detail, promotion, demonstration and selling, service, complaints, all phases office routine. Managerial ability—can relieve or assist busy executive—take charge small office. Objective—chance to work and advance with responsible firm. New York City or immediate vicinity. References. Box 1090, Air Conditioning & Refrigeration News.

YOUNG, CAPABLE and energetic sales engineer, with proven sales ability and experience in both the commercial and air conditioning fields, desires connection with manufacturer. Past experience includes direct selling, establishment of dealers and distributors, and engineering application. Applicant is a university graduate. Box 1094, Air Conditioning & Refrigeration News.

SERVICE and installation man: Four years with nation's second largest Kelvinator distributor. Experienced on entire line to twenty horsepower. Served one season as junior engineer. Twenty-eight, married, four dependents, own car and tools. References from above mentioned firm. Go anywhere, work any make. F. M. BARRELL, 1512 Garland, Wichita, Kansas.

### EQUIPMENT WANTED

WANTED IMMEDIATELY — Used 15 horsepower complete highside in good condition. Prefer "FREON" job. What have you for cash? Write or wire complete description and best price. E. R. I., 1232 14th Street, N. W., Washington, D. C.

### REPAIR SERVICE

PRESSURE GAUGES Repaired, all types. Refrigeration, ammonia, steam, hydraulic and air. Prices: 25¢ an inch; example, 2" gauge 50¢, 2½" gauge 65¢, 3" gauge 75¢. Ammonia gauges and gauges exceeding 1,000 pounds 50¢ an inch. NATIONAL ELECTRIC SWITCH CO., 1966 Broadway, New York City.

GENERAL ELECTRIC and Westinghouse hermetic units rebuilt. Guaranteed unconditionally for one year and returned to you finished like new. Units are entirely disassembled in our large modern shop, tested through every step of production during rebuilding with the most complete test equipment for accurate work, then subjected to exhaustive running tests under actual operating conditions. Each unit measures to exacting standards after rebuilding. Prices \$30.00 on General Electric DR-1, DR-2, and Westinghouse; \$35.00 on General Electric DR-3. Quotations furnished on other models. Quick service—guaranteed work. REFRIGERATION MAINTENANCE CORP., 321-27 East Grand Avenue, Chicago, Ill.

CONTROL REPAIR service. Your controls repaired by expert mechanics, with special precision equipment. Supervised by graduate engineers. We stress perfection and dependability before price. One year guarantee on domestic controls. Any bellows operated device repaired. HALETRIC LABORATORY, 1793 Lakewood Road, Cleveland, Ohio.

### PATENTS

HAVE YOUR patent work done by a specialist. I have had more than 25 years' experience in refrigeration engineering. Prompt searches and reports. Reasonable fees. H. R. VAN DEVENTER (ASRE), Patent Attorney, 342 Madison Avenue, New York City.

## THE BUYER'S GUIDE

### The Velvet Action Of A PEERLESS EXPANSION VALVE is Due To Superior Design

There is no jumping, jerking or jittering — just a sure, steady movement that makes Peerless the most advanced thermal expansion valve in the industry. The body of the valve can be placed in a temperature either higher or lower than the bulb temperature without affecting control. Valve is charged with refrigerant having same pressure-temperature characteristics as the refrigerant with which it is used. This causes a more constant superheat throughout entire temperature range. Try a Peerless on your next job and see the difference.

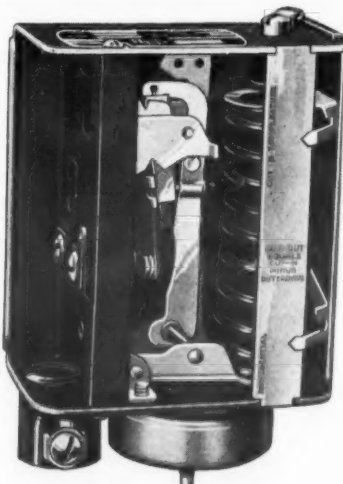
### PEERLESS OF AMERICA INC.

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Pacific Coast Factory  
3000 S. Main Street  
Los Angeles  
Export Division  
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Packed in Tamper-proof Metal Container  
Available in Wide Range of Orifice Sizes  
Threaded Sealed Capillary Tube  
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### For All Commercial Applications—RANCO Type "G"

A SIMPLE, compact commercial control. Completely new — completely dependable. High capacity — 1-1/2 H.P. 110-220 V., A.C.; 3/4 to 1-1/2 H.P. 115-220 V., D.C. Made with stainless steel springs and toggle mechanism. Maintains accurate settings.

Ranco Type "G" Control is designed for all commercial applications. Important new features!

Write for Bulletin

Ranco INC.,  
Columbus, Ohio, U.S.A.

**SUPER QUICK CHILLING**

**LARGE STORAGE CAPACITY**

**NO SOAKED OFF LABELS**

**ZEROSTREAM**

**DRY STORAGE BEVERAGE COOLER**

Its performance is revolutionary and unbelievable... Nothing else like it.

**KOCH REFRIGERATORS**

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**OPERATING COST LOW**

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LIVE DISTRIBUTORS WILL BE INTERESTED



# Industrial Relations

## Survey of 370 New Store Employees Reveals Their Reaction To the Job, and Their Needs

NEW YORK CITY—Three basic necessities affecting all employee reactions—the need to work, the need for self-respect, and the need for an ideal, were revealed in an analysis published recently by the personnel group of the National Retail Dry Goods Association concerning the reactions of 370 new store workers during the period of their being hired and initiated into their jobs.

Realizing that a favorable job attitude is a prerequisite to harmonious employer-employee relations and aware that the first impressions gained by the new workers in the process of being engaged and inducted into store positions are last-

ing and will be reflected in the efficiency of the store, the personnel group, with the aid of the School of Retailing, New York University, the Prince school, and personnel leaders, has attempted to appraise the early experiences of retail employees.

The comments of 370 new employees, representing both selling and non-selling divisions of seven department stores in large western cities, in the questionnaires in which they were requested to explain their reactions in the first stages of employment, were recorded and analyzed in the comprehensive study published by the personnel group. The fear of the employees that their answers

might be personally identified was eliminated, and every other method was used to encourage them to be frank.

The ambitions, loyalties, slights, distrusts, good and bad impressions, and exasperations of the new employees all were considered in the survey. The questionnaires included such queries as, "Did the first person who spoke to you seem pleasant or unpleasant and why?" "Was your salary discussed and clearly explained to you?" "Did your classroom training increase or decrease your interest and enthusiasm for the job?" and "How soon did you meet department executives?"

From the hundreds of individual replies received, the personnel group discovered that the need for work motivates not only job seeking but also job holding, and that holding a job is a primary concern of the employee. The attitude of the employee has been influenced by the fact that an employer's market has existed in the retail field for several years.

This condition has created a bond of loyalty and appreciation between employees and management for the simple fact of employment, and has made people less critical of their jobs and the treatment accorded them.

### 'INDIVIDUALITY' IMPORTANT

Another factor affecting the job attitude is the need for self-respect, the survey discovered. "Every employee is anxious to be important, to count as an individual, to feel that he has something to contribute to the organization in which he works, to feel that his problems, reactions, opinions, are deemed worthy of consideration by his superiors, and to achieve some measure of success in what he is doing."

The desire of the employee to do his job well was shown in the survey, and for this reason demonstrated that the employees welcome any opportunity to discuss problems concerning system, merchandise, customers, etc., particularly the type of discussion in which the employee is asked to voice his own opinion on various matters.

Pep talks of the "you've got to sell more for dear old X store and your jobs" variety are disliked by the new workers, although they respond well to meetings, lectures, fashion shows, bulletins, and similar efforts to give them merchandise information.

### INSTRUCTION SOUGHT

The questionnaires also showed that although contests did not meet with much approval as means to increase efficiency, that employees were grateful for any actual instruction given them to make them more efficient in the performance of their duties.

The third fundamental need expressed by the employees in the study, the need for an ideal, was for something concrete with which the employee can identify himself. The study points out that this need was expressed in many ways in the comments. Some gave reasons for personal loyalty to the store or its reputation and policies, while others described it through their pride in the merchandise and service offered by the establishment.

The reactions of the employees in being hired, trained, and inducted also were revealed in the study. The personnel group discovered that while not critical of the employment office on the whole, that applicants are appreciative of any special attempts to provide for their comfort and convenience. Lack of adequate space and lack of privacy for interviews were the most frequent things cited against the employment office, and the reactions to the employment office personnel were almost uniformly good.

### 'BAWLINGS OUT' RESENTED

All the workers questioned felt that the system under which they had been trained was a fair one, and although few offered criticism of the training classrooms, many felt that the training itself could be improved. Some complained that while they learned much about store system that was useful to them they did not receive enough information on the actual methods of performing their specific jobs, while others felt that the system, which is largely mechanical, could be learned on the floor, and they wanted merchandise information and salesmanship hints in the classroom.

Another fact noted in the study was that in most cases employees

## What This Page Is All About

"Public relations" is a much-banded-about phrase today. It is now recognized as something every company ought to indulge in, even if it does seem pretty vague.

There was the cartoon seen not long ago wherein a corpulent and bespattered executive was telling his secretary to "call up one of those publication relations birds and find out how much it costs to give this corporation a soul."

But those who look upon "public relations" or "industrial relations" as a necessary evil—something to be included in the budget along with allowances for taxes and depreciation—aren't likely to get much for their money.

Hiring a publicity man, or calling in the gold-plated public relations experts from New York, doesn't change the situation if the men who comprise the company don't understand what's going on. Successful public and industrial relations consist of a multiplicity of little things, things which attract the favorable attention and win the goodwill of employees and the town where they work, of customers, and the communities in which they live. The entire personnel must cooperate in such activities.

On this page AIR CONDITIONING & REFRIGERATION News is reporting on news and activities in industrial relations.

respond favorably to calm correction by executives or to some impersonal method, such as a notification slip, but all resent being reprimanded in public.

Contrary to the expectations of the personnel group, the need for self-respect does not create a desire for higher wages, at least among the people of this survey, for while salary or wages were mentioned occasionally, they were regarded as an adjunct and not as an end in themselves. Promotion or lack of it was stressed to a greater degree than salary increases as a factor in determining loyalty and satisfaction.

## Inter-Department Meetings Help Firm's Problems

WORCESTER, Mass.—The Graton & Knight Co. of this city has discovered that regular meetings of foremen with the superintendent have provided a place for frank discussion of common problems, promoted constructive thinking that will assist in solving these difficulties, coordinated efforts for more efficient operation of inter-departmental activities, and developed a better understanding between department heads.

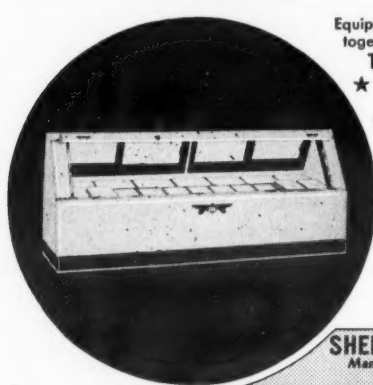
## S.W.O.C. Files Charges Against York Group

YORK, Pa.—Charges that the Ice Machinery Independent Employee Association is a "company union" were filed Nov. 15 against both the York Ice Machinery Corp. and the Employee Association with the National Labor Relations Board by the Steel Workers Organizing Committee.

As a former contract with the Association expired Nov. 1, the company is negotiating with the Association on the terms of a contract for working conditions for 1939. Now a temporary measure is in effect until Dec. 15, by which time it is expected that the 1939 contract will be completed.

At a meeting of the Employee Association on Nov. 14, Truman J. Keesey, temporary president of the York County Industrial Union Council (SWOC affiliate) distributed a circular which stated that members of the York County Industrial Union receive higher wages and better working conditions than can be obtained with a "company-dominated bought-and-paid-for, law-violating stooge outfit."

## THE BUYER'S GUIDE



Equipment and Compressor sales go together. Sell both on one contract.

The Sherer Franchise Offers:

- ★ COMPLETE LINE OF CASES, COOLERS AND BOXES.
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Manufacturers of Refrigerated Display and Storage Equipment

PROFIT WITH  
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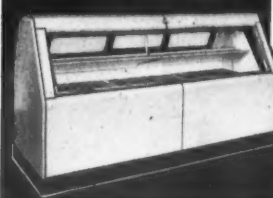
Write for catalog and franchise details, mentioning territory desired

## MILLS COMPRESSORS

for Commercial Use

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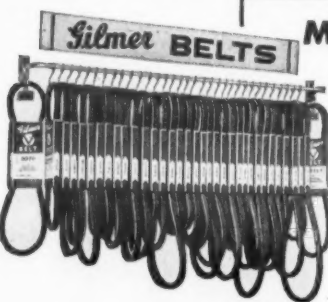
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FOUR YEARS ago Tyler originated its unique WELDED STEEL construction for commercial refrigerators. Now other makes are following. But Tyler still leads with new improvements and bigger values. Wide range of—Top Display...Double Duty...Delicatessen Cases...Reach-Ins...Walk-Ins. Sparkling streamlined beauty. Latest engineering advancements. Write today for dealer catalog.

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## AMINCO Pressure Controlled Water Regulating Valve

Aminco No. 614 Water Regulating Valve is quiet in operation, free from chattering; practically friction-free and provides a maximum flow of water with a minimum head pressure differential. This valve is available for all refrigerants except ammonia.

American Injector Company

1481 Fourteenth Avenue. Detroit, Mich.

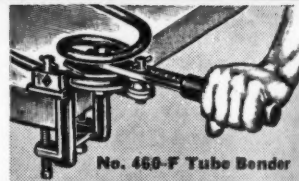
Pacific Coast: Van D. Clothier, 1015 E. 16th, Los Angeles, Calif.

## You can make COILS with this new IMPERIAL tube bender!

HERE'S something entirely new in tube benders—an Imperial hand tube bender that will not only handle all types of bends but you can easily form round and obround coils with it. Furnished in four sizes for 3/8", 1/2", 5/8" and 3/4" tubing.

Call your jobber and try out one of these new No. 408-F tube benders.

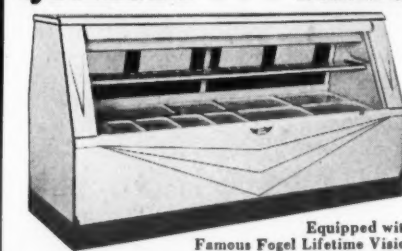
IMPERIAL BRASS MFG. CO., 565 S. Racine Ave., Chicago



## IMPERIAL Tube Benders

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Perfection of materials and workmanship are of supreme importance in Fogel construction.

We insist that every Fogel case must have lasting outward beauty, and solid quality between the walls.

Inquire today about our full line of refrigerated food storage and display equipment. Interesting distributor proposition to qualified firms.

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16th & Vine Sts., Phila., Pa.

## Chieftain No. 16 MANUFACTURERS—

You desire a well balanced product—the Tecumseh Hermetic can make this possible

TECUMSEH PRODUCTS CO., TECUMSEH, MICH.

## HENRY ABSO-DRY



## Pressure Sealed DEHYDRATECTOR

A combination dryer with liquid indicator. Gas bubbles passing under sight port glass indicate refrigerant shortage. Vacuum dried and pressure sealed. Choice of 5 dehydrants.

TYPE 721

WRITE FOR CATALOG

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# Contest Capers and Old and New Products Are In the Camera's Eye This Week



The entire General Electric home laundry equipment headquarters sallies out on deck in what is reputed not too reliably to be Singapore harbor—distributors' goal for the seventh week of the G-E "Sales Ahoy" contest on washer and ironer sales. All "decked" out, in this picture, are, left to right: Glenn Chaffer, sales manager; C. K. Skinner, managing engineer, with his wrench "Elmer"; George Nevin; J. V. White; John Wicht, manager; David Hays, commercial engineer; Harold Day; and Lee Wichelns, sales promotion manager.



In the Weaver's Clover Farms Store at Washington Court House, Ohio is the first installation of the "Polar Chest System" of refrigerated locker storage. The plant's lockers, in 100 units of four lockers each, are kept below floor level, and are raised to any desired height by means of an automatic lifting device. The lockers are concealed under insulated trap doors. Armstrong Cork Co. has made arrangements to market the "Polar Chest System." (Story of installation on page 4.)



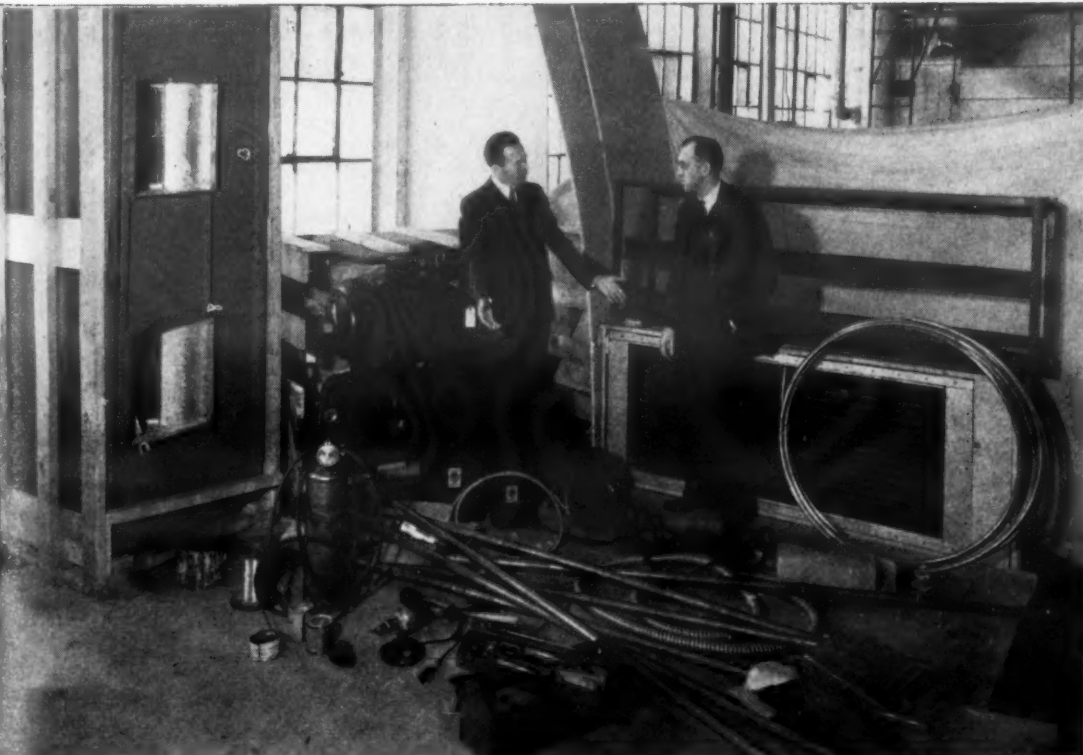
T. Schantz Hansen of the University of Minnesota examining insulation taken from a 12-year-old refrigerator in the presence of J. R. Webster of the General Electric Co., in tests to determine how insulation stands up. (See story on page 9.)



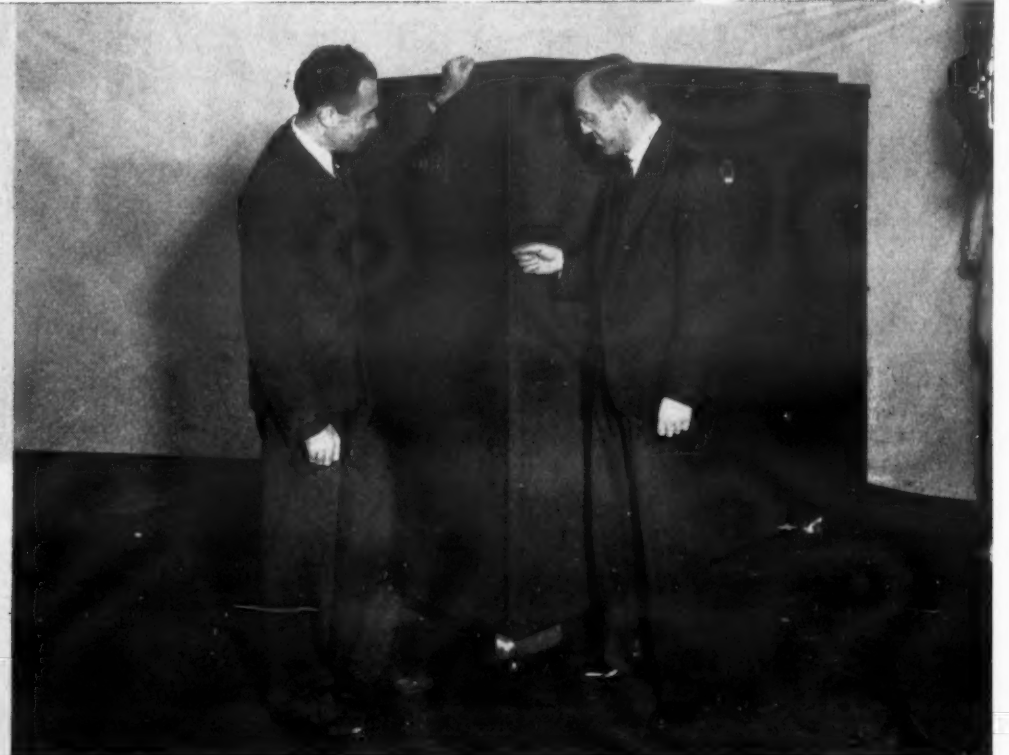
General Electric's new "Aurora" electric range is compact but very usable. It is built for installation flush against the wall and adjacent to or between cabinets. It has an oversize oven and three surface units.



When the Electrical, Radio & Refrigerator Club of Richmond, Inc., held its appliance show last month, Billy Burke, sales manager of Tower-Binford Electric & Mfg. Co., Crosley distributor, acted as master of ceremonies.



"But how could we get all of this stuff into a 'package' unit?" P. Y. "Phil" Danley, manager of the air-conditioning department of Westinghouse Electric & Mfg. Co., asks E. R. Wolfert, engineer at East Springfield, as he stands amid the pieces and parts that make up a 15-ton installation.



"Well I'll be darned," says Mr. Danley as Mr. Wolfert presents him with the first of the new packaged air conditioners which handle jobs up to 15 tons capacity. Power, water, and drain connections are the only things necessary to put the units in operation.